SEQUENCE LISTING

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<120> BIOLOGICAL CONTROL OF NEMATODES

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<170> FastSEQ for Windows Version 4.0

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<213> Xenorhabdus bovienii

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Ile Ser Trp Phe Ala Thr Gly Ile Pro Thr Val Asp Ala Leu Leu Ala
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Glu Glu Phe Trp His Gly Asp Lys Gln Ala Phe Pro Pro Phe Thr Cys
                20   25   30
Arg Phe Thr His Phe Asp Pro Asp Lys Glu Gln Asp Val Thr Leu Val
            35   40   45
Pro Ser Thr Glu Glu Ala Tyr Trp Leu His Arg Ala Leu Gln Gly Gln
        50   55   60
Pro Leu His Ser Glu Val Tyr Gly Asp Asp Gly Thr Ala Gln Ala Gly
65   70   75   80
Ile Pro Tyr Thr Val Met Asp Ser Arg Pro Gln Val Arg Leu Leu Thr
                85   90   95
Gly Leu Pro Gly Asn Ser Pro Thr Val Trp Pro Ser Val Ile Glu Gln
            100   105   110
Arg Thr Trp Gln Tyr Glu Arg Ile Ala Asp Asp Pro Gln Cys His Gln
            115   120   125
Gln Val Val Leu Asn Ser Asp Arg Tyr Gly Phe Pro Arg Glu Thr Val
        130   135   140
Asp Ile Ala Tyr Pro Arg Arg Pro Lys Pro Ala Val Ser Pro Tyr Pro
145   150   155   160
Asp Thr Leu Pro Ala Thr Leu Phe Asp Ser Ser Tyr Asp Glu Gln Gln
                165   170   175
Gln Gln Leu Arg Leu Thr Arg Gln Arg Gln His Tyr His His Leu Thr
                180   185   190
Asp Thr Glu His Gln Val Leu Gly Leu Pro Asp Val Met Arg Ser Asp

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            195                     200                     205
Ala Trp Gly Tyr Pro Ala Ala Arg Val Pro Arg Glu Gly Phe Thr Leu
    210                     215                     220
Glu Asp Leu Leu Ala Glu Asn Ser Leu Ile Ala Pro Gly Thr Pro Leu
225                     230                     235                     240
Thr Tyr Leu Gly His Gln Arg Val Ala Tyr Thr Gly Thr Thr Gly Thr
                245                     250                     255
Glu Glu Lys Pro Thr Arg Gln Ala Leu Val Ala Tyr Thr Glu Thr Ala
            260                     265                     270
Val Phe Asp Glu Leu Ala Leu Gln Ala Phe Asn Gly Thr Leu Ser Pro
            275                     280                     285
Glu Ala Leu Glu Lys Lys Leu Ile Glu Ser Gly Tyr Leu Ser Val Pro
    290                     295                     300
Arg Pro Phe Asn Thr Gly Ala Glu Ser Ala Val Trp Val Ala Arg Gln
305                     310                     315                     320
Gly Tyr Thr Asp Tyr Gly Gly Ser Glu Ala Phe Tyr Arg Pro Leu Ala
                325                     330                     335
Gln Arg Thr Thr Val Gln Ile Gly Lys Asn Thr Leu His Trp Asp Thr
            340                     345                     350
His Tyr Cys Ala Val Val Arg Met Gln Asp Ala Ala Gly Leu Tyr Thr
            355                     360                     365
Asp Ala Ala Tyr Asp Tyr Arg Phe Leu Thr Pro Val Gln Ile Thr Asp
    370                     375                     380
Ala Asn Asp Asn Gln Gln His Ile Thr Leu Thr Ala Leu Gly Gln Val
385                     390                     395                     400
Ser Ser Gly Arg Phe Trp Gly Thr Glu Glu Gly Thr Pro Gln Gly Tyr
                405                     410                     415
Thr Pro Pro Glu Asp Arg Pro Phe Thr Pro Pro Ser Ser Val Ala Glu
            420                     425                     430
Ala Leu Asp Leu Lys Pro Asp Leu Pro Val Ala Asn Cys Met Val Tyr
            435                     440                     445
Ala Pro Leu Ser Trp Met Pro Leu Ala His Thr Tyr Gln Glu Tyr Ile
    450                     455                     460
Ala Gly Phe Thr Trp Gln Ala Leu Leu Asp Ala Gly Val Val Thr Glu
465                     470                     475                     480
Asp Lys Arg Val Cys Ala Leu Gly Phe Arg Arg Trp Val Gln Arg Gln
                485                     490                     495
Gly Ile Val Leu Asn Gly Gln Ala Leu Ala Asp Ser Arg Glu Pro Val
            500                     505                     510
His Val Leu Thr Leu Ala Thr Asp Arg Tyr Asp Thr Asp Pro Asp Gln
            515                     520                     525
Gln Leu Arg Lys Ser Val Thr Tyr Ser Asp Gly Phe Gly Arg Leu Leu
    530                     535                     540
Gln Ser Ala Val Tyr His Ala Pro Gly Glu Ala Trp Gln Arg Ala Ala
545                     550                     555                     560
Asp Gly Ser Leu Ile Thr Asp Ala Lys Gly Ala Pro Leu Val Ala His
                565                     570                     575
Thr Ala Thr Arg Trp Ala Val Ser Gly Arg Thr Glu Tyr Asp Gly Lys
            580                     585                     590
Gly Gln Pro Val Arg Thr Tyr Pro Pro Phe Phe Leu Asn Ala Trp Gln
            595                     600                     605
Tyr Leu Ser Asp Asp Ser Ala Arg Gln Asp Leu Asn Ala Asp Thr His
    610                     615                     620
Arg Tyr Asp Pro Leu Gly Arg Glu Tyr Gln Val Arg Thr Ala Lys Gly
625                     630                     635                     640
Tyr Leu Arg Gln Asn Arg Leu Thr Pro Trp Phe Val Val Asn Glu Asp
                645                     650                     655
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Glu Asn Asp Thr Leu Ser
            660

<210> 2
<211> 105
<212> PRT
<213> Xenorhabdus bovienii

<400> 2
Tyr Leu Pro Gln Arg Gly Gln Cys Asp Met Leu Leu Val Val Ile Gly
 1   5   10   15
Ile Gly Tyr Leu Asn Gly Gly Gln Glu Ala Val Ile Ile Gly Gly Ile
            20   25   30
Arg Val Gln Thr Arg Arg Ile Leu His Thr Asp Asp Arg Thr Val Met
            35   40   45
Gly Ile Pro Met Glu Gly Val Phe Ala Asn Leu His Arg Arg Pro Leu
        50   55   60
Ser Gln Arg Thr Val Lys Arg Leu Arg Pro Ala Val Ile Gly Ile Ser
65   70   75   80
Leu Thr Gly Asp Pro Asp Arg Arg Phe Arg Thr Gly Ile Glu Trp Ala
            85   90   95
Trp Asn Arg Gln Ile Thr Arg Leu Asp
            100   105

<210> 3
<211> 971
<212> PRT
<213> Xenorhabdus bovienii

<400> 3
Ser His Leu Pro Ala Arg Tyr Gly Gly Arg Leu Thr Thr Leu Ser Arg
 1   5   10   15
Lys Gly Phe Met Thr Val Asn Arg Gly Asp Asn Leu His Gln Lys Thr
            20   25   30
Pro Glu Val Thr Val Leu Asp Asn Arg Gly Leu Thr Val Arg Glu Leu
            35   40   45
Arg Tyr His Arg His Pro Asn Thr Pro Thr Thr Thr Asp Glu Arg Ile
        50   55   60
Thr Arg His Arg Phe Thr Leu Ser Gly Gln Leu Ala His Ser Ile Asp
65   70   75   80
Pro Arg Leu Phe Asp Leu Gln Gln Thr Asp Asn Thr Val Asn Pro Asn
            85   90   95
Met Ile Tyr Asp Thr Ala Leu Thr Gly Glu Val Val Arg Thr Arg Ser
            100   105   110
Val Asp Ala Gly Asn Asp Leu Ile Leu Asn Asp Ile Thr Gly Arg Pro
            115   120   125
Val Leu Ala Ile Asn Ala Thr Glu Val Thr Arg Thr Trp Gln Tyr Glu
            130   135   140
Asn Asp Thr Leu Pro Gly Arg Pro Leu Ser Ile Thr Glu Gln Pro Ala
145   150   155   160
Gly Glu Ala Gly Arg Ile Thr Glu Arg Phe Val Trp Ala Gly Asn Ser
            165   170   175
Gln Ala Glu Lys Asn Ser Asn Leu Ala Gly Gln Cys Val Arg His Tyr
            180   185   190
Asp Thr Ala Gly Leu Asn Gln Thr Asp Ser Ile Ala Leu Asn Gly Ile
            195   200   205
Pro Leu Ser Val Thr Arg Gln Leu Leu Pro Asp Gly Thr Asp Ala Asp

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            210                    215                    220
Trp Gln Gly Asn Asn Glu Pro Ala Trp Asn Asp Arg Leu Ala Pro Glu
225                    230                    235                    240
Asn Phe Thr Thr Leu Ser Thr Ala Asp Ala Thr Gly Ala Val Leu Thr
                   245                    250                    255
Thr Thr Asp Ala Ala Gly Asn Leu Gln Arg Val Ala Tyr Asp Val Ala
            260                    265                    270
Gly Leu Leu Thr Gly Ser Trp Leu Arg Leu Ala Gly Gly Thr Glu Gln
            275                    280                    285
Val Ile Val Lys Ser Leu Thr Tyr Ser Ala Ala Gly Gln Lys Leu Arg
            290                    295                    300
Glu Glu His Gly Asn Gly Val Val Thr Thr Tyr Thr Tyr Glu Pro Glu
305                    310                    315                    320
Thr Gln Arg Leu Val Gly Ile Lys Thr Lys Arg Pro Gln Gly His Ala
                   325                    330                    335
Gln Gly Thr Lys Val Leu Gln Asp Leu Arg Tyr Glu Tyr Asp Pro Val
            340                    345                    350
Gly Asn Val Val Lys Val Thr Asn Asp Ala Glu Val Thr Arg Phe Trp
            355                    360                    365
Arg Asn Gln Lys Val Val Pro Glu Asn Thr Tyr Val Tyr Asp Ser Leu
            370                    375                    380
Tyr Gln Leu Val Ser Ala Thr Gly Arg Glu Met Ala Asn Ile Val Gln
385                    390                    395                    400
Gln Ser Thr Leu Leu Pro Thr Pro Ser Leu Ile Asp Ser Ser Thr Tyr
                   405                    410                    415
Ser Asn Tyr Ser Arg Thr Tyr Asn Tyr Asp Arg Gly Asp Asn Leu Thr
            420                    425                    430
Gln Ile Arg His Ser Ala Pro Ala Thr Gly Asn Ser Tyr Thr Thr Asp
            435                    440                    445
Ile Thr Val Ser Asp His Ser Asn Arg Ala Val Leu Asp Thr Leu Thr
            450                    455                    460
Asp Asp Pro Ala Lys Val Asp Ala Leu Phe Thr Ala Gly Gly His Gln
465                    470                    475                    480
Ile Pro Leu Gln Pro Gly Gln Asn Leu Val Trp Thr Pro Arg Gly Glu
                   485                    490                    495
Leu Leu Lys Val Ala Pro Val Val Arg Asp Gly Gln Ile Ser Asp Gln
            500                    505                    510
Glu Ser Tyr Arg Tyr Asp Ala Ala Ser Gln Arg Ile Ile Lys Thr His
            515                    520                    525
Val Gln Gln Thr Ala Asn Ser Ser Gln Ala Gln Ser Thr Leu Tyr Leu
            530                    535                    540
Pro Gly Leu Glu Arg His Thr Thr Ile Asn Gly Thr Thr Val Lys Glu
545                    550                    555                    560
Val Leu His Val Ile Thr Ile Gly Glu Ala Gly Arg Ala Gln Val Arg
                   565                    570                    575
Val Leu His Trp Glu Asn Gly Lys Pro Gly Ala Ile Ser Asn Asn Gln
            580                    585                    590
Met Arg Tyr Ser Tyr Asp Asn Leu Ile Gly Ser Ser Gly Leu Glu Val
            595                    600                    605
Asp Gly Asp Gly Gln Ile Ile Ser Met Glu Glu Tyr Tyr Pro Tyr Gly
            610                    615                    620
Gly Thr Ala Val Trp Thr Ala Arg Ser Gln Thr Glu Ala Asp Tyr Lys
625                    630                    635                    640
Thr Val Arg Tyr Ser Gly Lys Glu Arg Asp Ala Thr Gly Leu Tyr Tyr
                   645                    650                    655
Tyr Gly Tyr Arg Tyr Tyr Gln Pro Trp Ala Gly Ser Trp Leu Ser Ala
            660                    665                    670
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Asp Pro Ala Gly Thr Ile Asp Gly Leu Asn Leu Tyr Arg Met Val Arg
        675                 680                 685
Asn Asn Pro Ala Thr Leu Asp Asp Lys Asn Gly Leu Ala Pro Gly Asn
        690                 695                 700
Arg Tyr Val Phe Phe Pro Phe Ile His Glu Asp Arg Ile Phe Arg Leu
705                 710                 715                 720
Ala Ser Ala Asn Val Tyr Arg Thr Glu His Asn Lys Ser Asp Ile Ile
                725                 730                 735
Ala Val Val Glu Asp Lys Ala Leu Asp Ser Lys Leu Phe Thr Asn Ser
            740                 745                 750
Ile Glu Gln Phe Phe Lys Lys Pro Lys Gly Lys Ala Ile Leu Lys Gly
        755                 760                 765
Ser Pro Asp Ile Lys Glu Arg Leu Leu Asn Asn Ile Val His Asp Leu
    770                 775                 780
Ser Asn Met Gln Val Gly Asp Gln Leu Tyr Val Asn Ala His Gly His
785                 790                 795                 800
Ser Ala Lys Pro Phe Phe Tyr Ser Asp Ser Gly Tyr Ser Lys Ile Ile
                805                 810                 815
Met Glu Gln Leu Gln Arg Gly Ala Asn Tyr Val Ala Lys Asp Leu Val
            820                 825                 830
Asn Lys Phe Lys Leu Pro Glu Asn Ala Thr Ile Lys Ile Ser Thr Cys
        835                 840                 845
His Ser Ala Glu Gly Lys Gly Ala His Ile Thr Val Thr Ser Thr Gly
    850                 855                 860
Thr Asn Glu Lys Met Arg Tyr Ser Ser Ile Ile Glu Asn Lys Gly Glu
865                 870                 875                 880
Phe Ser Arg Ser Leu Ala Gly Thr Met Glu Asn Glu Leu Ile Lys Leu
                885                 890                 895
Gln Pro Gly Arg Val Arg Gly Asn Val Tyr Gly Tyr Leu Gly Ala Thr
            900                 905                 910
Thr Phe Tyr Gly Ala Lys Asn Glu Lys Val Ile His Leu Lys Asp Gly
        915                 920                 925
Asn Leu Thr Thr Gly Val His Glu Gly Lys Leu Ser Met Phe Thr Lys
    930                 935                 940
Lys Asn Arg Phe Ser Glu Asn Ile Phe Gly Leu Lys Val Lys Arg Ser
945                 950                 955                 960
Leu Thr Arg Thr Asn Phe Thr Gly Ser Gly Val
            965                 970
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<210> 4
<211> 108
<212> PRT
<213> Xenorhabdus bovienii

<400> 4
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Pro Ala Ala Glu Tyr Val Arg Asp Phe Thr Ile Thr Cys Ser Val Pro
  1                 5                 10                  15
Pro Ala Ser Arg Ser Gln Leu Pro Val Ser Arg Pro Ala Thr Ser Tyr
            20                  25                  30
Ala Thr Arg Cys Arg Leu Pro Ala Ala Ser Val Val Val Ser Thr Ala
        35                  40                  45
Pro Val Ala Ser Ala Val Leu Arg Val Val Lys Phe Ser Gly Ala Ser
    50                  55                  60
Arg Ser Phe Gln Ala Gly Ser Leu Phe Pro Cys Gln Ser Ala Ser Val
65                  70                  75                  80
Pro Ser Gly Ser Ser Trp Arg Val Thr Asp Ser Gly Met Pro Leu Ser
                85                  90                  95
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Ala Ile Leu Ser Val Trp Phe Ser Pro Ala Val Ser
        100   105

<210> 5
<211> 256
<212> PRT
<213> Xenorhabdus bovienii

<400> 5
Gln Arg Ala Leu Leu Asn Asp Ile Gly His Phe Ala Pro Gly Gly Thr
1   5   10   15
Asp Gln Leu Ile Gln Ala Val Ile Asp Ile Gly Val Leu Arg His His
        20   25   30
Phe Leu Val Ala Pro Glu Ala Gly Asn Leu Arg Ile Val Arg His Phe
        35   40   45
His His Val Pro His Arg Val Val Leu Ile Ala Gln Val Leu Gln His
     50   55   60
Leu Arg Pro Leu Cys Met Ser Leu Trp Ala Phe Gly Phe Tyr Ala Asn
65   70   75   80
Lys Ala Leu Gly Leu Arg Leu Val Gly Val Gly Gly His His Ala Val
        85   90   95
Ala Val Leu Phe Ala Gln Phe Leu Thr Arg Gly Gly Ile Arg Gln Gly
        100   105   110
Phe His Asp Asn Leu Leu Cys Pro Ala Arg Lys Pro Gln Pro Thr Ala
        115   120   125
Ser Gln Gln Ala Cys Tyr Val Ile Arg His Thr Leu Gln Val Thr Gly
        130   135   140
Arg Ile Gly Gly Gly Gln Tyr Arg Ala Gly Gly Ile Arg Arg Ala Gln
145   150   155   160
Gly Gly Glu Val Phe Arg Cys Gln Pro Val Val Pro Gly Gly Phe Ile
          165   170   175
Val Ser Leu Pro Val Cys Val Arg Thr Ile Arg Gln Gln Leu Ala Arg
        180   185   190
Asp Gly Gln Arg Tyr Ala Val Lys Arg Asn Thr Val Arg Leu Val Gln
        195   200   205
Ser Gly Gly Val Ile Val Thr His Ala Leu Ser Gly Gln Val Ala Val
        210   215   220
Leu Leu Arg Leu Thr Val Pro Cys Pro Asp Lys Thr Leu Cys Asp Thr
225   230   235   240
Ala Cys Phe Ala Ser Arg Leu Phe Cys Asp Thr Glu Arg Ala Ser Gly
          245   250   255

<210> 6
<211> 316
<212> PRT
<213> Xenorhabdus bovienii

<400> 6
Ser Asp Arg Arg Gln Thr Gly Tyr Ala Tyr Ser Ala Asp His Tyr Arg
1   5   10   15
Ile Ser Gly Arg Ser Thr Val Cys Thr Val Arg Ala Gly Leu Met Asn
        20   25   30
Tyr Gln Cys Trp Leu Gln His Ala Ala Thr Gln Leu Ser Glu Ser Asp
        35   40   45
Ser Pro Lys Arg Asp Ala Glu Ile Leu Leu Gly Tyr Val Thr Gly Arg
        50   55   60
Ser Arg Thr Tyr Leu Ile Ala Phe Asp Glu Thr Leu Ile Ser Ser Glu

```
65                          70                          75                          80
Glu Leu His Gln Leu Asp Ser Leu Leu Val Arg Arg Ile Gln Gly Glu
                    85                          90                          95
Pro Val Ala Tyr Ile Ile Gly Glu Arg Glu Phe Trp Ser Leu Pro Phe
                100                         105                         110
Ala Val Ser Pro Ala Thr Leu Ile Pro Arg Pro Asp Thr Glu Cys Leu
                115                         120                         125
Val Glu Lys Ala Leu Glu Leu Leu Pro Asp Ser Pro Ala Arg Ile Leu
            130                         135                         140
Asp Leu Gly Thr Gly Thr Gly Ala Ile Ala Leu Ala Leu Ala Ser Glu
145                         150                         155                         160
Arg Asn Asp Cys Tyr Val Thr Gly Val Asp Ile Asn Ser Asp Ala Val
                    165                         170                         175
Met Leu Ala Gln His Asn Ala Glu Lys Asn Ala Gly Lys Leu Ala Ile
                180                         185                         190
His Asn Val Asn Phe Leu Gln Ser Glu Trp Phe Ala Ala Val Gly Asn
                195                         200                         205
Gln Gln Phe Asp Met Ile Val Ser Asn Pro Pro Tyr Ile Asp Glu Arg
            210                         215                         220
Asp Pro His Leu Gln Glu Gly Asp Ile Arg Phe Glu Pro Ala Thr Ala
225                         230                         235                         240
Leu Ile Ala Ala Gln Asn Gly Met Ala Asp Leu Gln Ala Ile Val Gly
                245                         250                         255
Gln Ala Arg His Phe Leu Ser Pro Asn Gly Trp Leu Leu Leu Glu His
                260                         265                         270
Gly Trp Lys Gln Gly Thr Val Val Arg Asn Leu Phe Leu Glu Lys Gly
            275                         280                         285
Tyr Gln Gln Ile Ala Thr Phe Gln Asp Tyr Gly Gly Asn Glu Arg Ile
            290                         295                         300
Thr Ile Gly Arg Trp Asn Lys Asn Glu Thr His Ser
305                         310                         315
```

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<210> 7
<211> 102
<212> PRT
<213> Xenorhabdus bovienii

<400> 7
Ala Arg Arg Ala Val Arg Arg Cys Gly Tyr Cys Thr Gly Arg Thr Glu
 1                   5                   10                          15
Ser Arg Val Pro Ser Val Thr Thr Arg Cys Ala Thr Ala Met Ile Thr
                20                      25                      30
Leu Ser Ala Ala Ala Val Trp Arg Trp Thr Val Thr Asp Lys Leu Ser
            35                      40                      45
Val Trp Lys Asn Thr Thr Arg Thr Gly Ala Leu Arg Cys Gly Arg Arg
    50                      55                      60
Gly Val Arg Gln Arg Leu Ile Thr Arg Leu Cys Val Thr Gln Ala Arg
65                      70                      75                      80
Ser Gly Met Gln Arg Gly Cys Ile Ile Thr Ala Thr Gly Ile Thr Ser
                85                      90                      95
Arg Gly Arg Gly Ala Gly
            100
```

```
<210> 8
<211> 130
<212> PRT
<213> Xenorhabdus bovienii
```

```
<400> 8
Trp Gln Asn Gly Gly Ser Ser Ser Thr Thr Pro Arg Tyr Leu Ala Gly
1               5                   10                  15
Cys Tyr Val Trp Tyr Pro Cys Ser Ala Arg Leu Ser Gly Asn Ala Lys
            20                  25                  30
Ser Leu Leu Ala Pro Asp Gly Glu Trp Met Lys His Thr Leu Lys Ser
        35                  40                  45
Lys Ala Ser Gly Asn Thr Phe Thr Gly Arg Leu Ile Pro Thr Gly Arg
    50                  55                  60
Pro Thr Val Val Thr Ile Asp Lys Ser Gly Ala Asn Thr Ala Ala Leu
65                  70                  75                  80
Thr Leu Leu Asn Ala Glu Gly Glu Pro Gln Gln Gly Ile Glu Ile Arg
            85                  90                  95
Gln Asn Lys Tyr Leu Asn Asn Arg Ile Glu Gln Asp His Arg His Val
            100                 105                 110
Lys Arg Arg Ile Arg Pro Met Leu Gly Phe Lys Ser Phe Arg Arg Ala
            115                 120                 125
Gln Thr
    130


<210> 9
<211> 119
<212> PRT
<213> Xenorhabdus bovienii

<400> 9
Ala Leu Leu Phe Leu Ser Glu Ser Arg Val Met Ser Leu Ile Arg Asn
1               5                   10                  15
Ala Phe Lys Leu Leu His Tyr Pro Val Asp Ile Met Ala Gln Cys Val
            20                  25                  30
Arg Trp Ser Leu Thr Tyr Ala Leu Ser Leu Arg Asn Leu Glu Glu Met
        35                  40                  45
Met Ala Lys Arg Gly Ile Phe Val Asp His Ala Thr Ile Pro Arg Trp
    50                  55                  60
Val Leu Arg Leu Val Pro Leu Leu Ser Lys Ala Phe Arg Lys Arg Lys
65                  70                  75                  80
Lys Pro Val Gly Ser Arg Trp Arg Met Asp Glu Thr Tyr Ile Lys Val
            85                  90                  95
Lys Gly Gln Trp Lys Tyr Leu Tyr Arg Ser Val Asp Thr Asp Gly Gln
            100                 105                 110
Thr Asp Cys Gly Asp Tyr Arg
        115


<210> 10
<211> 138
<212> PRT
<213> Xenorhabdus bovienii

<400> 10
Val His Ser Pro Ser Gly Ala Val Ala Pro Gly Lys Phe Phe Ile Glu
1               5                   10                  15
Asn Phe Ala Asp Thr Phe Pro Ala Pro Leu Pro Leu His Pro Phe Ile
            20                  25                  30
Asp Ala Cys Ile Gln Gln Gly Phe Gln Leu Leu Pro Cys Leu Ile Ala
        35                  40                  45
Ile Ala His Ser Gly Lys Gln Ala Phe Glu Cys Val Leu Leu Asp Arg
```

```
        50                      55                      60
Leu Ala Leu Gln Gly Ser Gln Cys Leu Gln Ala Leu Val Leu Pro Val
65                      70                      75                      80
Gly Asp Val Asn Gly Gln Thr Ala His Gly Phe Leu Leu Ile Gly Tyr
                    85                      90                      95
Thr Gln Thr His Ile Ser Thr Tyr Asn Gly Leu Trp Leu Phe Ile Thr
                100                     105                     110
Gln Gly Val Arg Tyr Arg Phe Val Arg Gln Thr Phe Val Cys Arg Ser
            115                     120                     125
Leu Ser Phe Ser Glu Asp Asp Cys Thr Asn
            130                     135
```

<210> 11
<211> 110
<212> PRT
<213> Xenorhabdus bovienii

<400> 11
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Arg Thr Cys Arg Glu Arg Pro Arg Leu Met Asp Tyr Val Leu Thr Lys
 1                       5                      10                      15
Ala Ala Glu Ala Asp Leu Arg Ala Ile Ile Arg His Thr Arg Lys Gln
                    20                      25                      30
Trp Gly Asp Ala Gln Val Arg Arg Tyr Ile Thr Ala Leu Glu Gln Gly
            35                      40                      45
Ile Ala Arg Leu Ala Val Gly Gln Gly Ser Phe Lys Asp Met Ser Ala
        50                      55                      60
Leu Phe Pro Ala Leu Arg Met Ala His Cys Glu Arg His Tyr Val Phe
65                      70                      75                      80
Cys Leu Pro Arg Glu Asn Ala Pro Ala Leu Ile Val Ala Ile Phe His
                    85                      90                      95
Glu Arg Met Asp Leu Leu Thr Arg Leu Ala Asp Arg Leu Lys
                100                     105                     110
```

<210> 12
<211> 103
<212> PRT
<213> Xenorhabdus bovienii

<400> 12
```
Pro Gln Thr Ile Ile Cys Ala Asn Val Gly Leu Cys Ile Thr Asp Lys
 1                       5                      10                      15
Glu Lys Thr Met Ser Arg Leu Thr Ile Asp Ile Thr Asp Arg Gln His
                    20                      25                      30
Gln Ser Leu Lys Ala Leu Ala Ala Leu Gln Gly Lys Thr Ile Lys Gln
            35                      40                      45
Tyr Ala Leu Glu Arg Leu Phe Pro Gly Met Ser Asp Ser Asp Gln Ala
        50                      55                      60
Trp Gln Glu Leu Lys Ala Leu Leu Asp Thr Arg Ile Asn Glu Gly Met
65                      70                      75                      80
Glu Gly Lys Gly Cys Gly Lys Ser Ile Gly Glu Ile Leu Asp Glu Glu
                    85                      90                      95
Leu Ala Gly Ser Asp Arg Ala
                100
```

<210> 13
<211> 265
<212> PRT

<213> Xenorhabdus bovienii

<400> 13
```
Asn Ala His Phe Leu Ile Val Ser Lys Thr Asn Val Val Met Ser Asn
1               5                   10                  15
Gln Asp Pro His Asn Lys Arg Asp Ser Leu Phe Ser Ala Pro Ile Ala
            20                  25                  30
Asn Leu Gly Asp Trp Ser Phe Asp Glu Arg Val Ala Glu Val Phe Pro
            35                  40                  45
Asp Met Val Lys Arg Ser Ile Pro Gly Tyr Ser Asn Ile Ile Ser Met
    50                  55                  60
Ile Gly Met Leu Ala Ser Arg Phe Val Thr Pro Gly Ser Gln Ile Tyr
65                  70                  75                  80
Asp Leu Gly Cys Ser Leu Gly Ala Ala Thr Leu Ser Ile Arg Arg Ser
                85                  90                  95
Ile Asn Ala Asp Asn Cys Arg Ile Ile Ala Ile Asp Asn Ser Pro Ala
            100                 105                 110
Met Ile Glu Arg Cys Arg Arg His Ile Asp Ser Phe Lys Ala Ser Thr
            115                 120                 125
Pro Val Glu Val Ile Glu Gln Asn Ile Leu Asp Thr Asp Ile Gln Asn
            130                 135                 140
Ala Ser Met Val Val Leu Asn Phe Thr Leu Gln Phe Leu His Pro Asp
145                 150                 155                 160
Asp Arg Gln Lys Ile Leu Lys Lys Ile Tyr Ala Gly Leu Lys Pro Gly
            165                 170                 175
Gly Val Leu Val Leu Ser Glu Lys Phe Asn Phe Glu Asp Gln Lys Ile
            180                 185                 190
Gly Glu Leu Leu Phe Asn Met His His Asp Phe Lys Arg Ala Asn Gly
            195                 200                 205
Tyr Ser Glu Leu Glu Val Ser Gln Lys Arg Ser Met Leu Glu Asn Val
    210                 215                 220
Met Arg Thr Asp Ser Val Asp Thr His Lys Ser Arg Leu Lys Glu Val
225                 230                 235                 240
Gly Phe Gln His Val Glu Val Trp Phe Gln Cys Phe Asn Phe Gly Ser
            245                 250                 255
Leu Leu Ala Ile Lys Gly Thr Glu Gln
            260                 265
```

<210> 14
<211> 324
<212> PRT
<213> Xenorhabdus bovienii

<400> 14
```
Thr Met Ile Asp Phe Gly Asn Phe Tyr Gln Leu Ile Ala Lys His Pro
1               5                   10                  15
Leu Asn His Trp Leu Asp Ser Leu Pro Ala Gln Leu Ser His Trp Gln
            20                  25                  30
Lys Thr Ser Gln His Gly Gln Phe Ser Ser Trp Val Lys Ile Leu Glu
            35                  40                  45
Asn Leu Pro Glu Ile Lys Pro Ser His Leu Asp Leu Lys Asn Gly Val
    50                  55                  60
Ile Ala Ile His Glu Pro Asp Leu Ser Lys Gly Glu Lys Ala Arg Leu
65                  70                  75                  80
His Asn Ile Leu Lys Ile Leu Met Pro Trp Arg Lys Gly Pro Phe Ser
                85                  90                  95
Leu Tyr Asp Val Glu Ile Asp Thr Glu Trp Arg Ser Asp Trp Lys Trp
```

```
                    100                        105                      110
Glu Arg Val Leu Pro His Ile Ser Pro Leu Glu Gly Lys Thr Val Leu
            115                      120                      125
Asp Val Gly Cys Gly Ser Gly Tyr His Met Trp Arg Met Val Gly Glu
        130                      135                      140
Gly Ala Gln Leu Val Val Gly Ile Asp Pro Thr Gln Leu Phe Leu Cys
145                      150                      155                      160
Gln Phe Glu Ala Ile Arg Lys Leu Leu Gly Asn Asn Gln Arg Ala His
                    165                      170                      175
Leu Leu Pro Leu Gly Ile Glu Gln Leu Pro Glu Leu Gln Ala Phe Asp
                180                      185                      190
Thr Val Phe Ser Met Gly Val Leu Tyr His Arg Arg Ser Pro Leu Asp
                195                      200                      205
His Leu Trp Gln Leu Lys Asn Gln Leu Val Ser Asp Gly Glu Leu Val
        210                      215                      220
Leu Glu Ser Leu Val Ile Glu Gly Asp Glu Asn Gln Cys Leu Ile Pro
225                      230                      235                      240
Gly Glu Arg Tyr Ala Gln Met Arg Asn Val Tyr Phe Ile Pro Ser Ala
                245                      250                      255
Lys Met Leu Lys Val Trp Leu Glu Lys Cys Gly Phe Val Asp Val Arg
            260                      265                      270
Ile Val Asp His Ala Ala Thr Thr Pro Asp Glu Gln Arg Arg Thr Glu
            275                      280                      285
Trp Met Lys Thr Glu Ser Leu Val Asp Phe Leu Asp Pro Ser Asp His
        290                      295                      300
Ser Lys Thr Ile Glu Gly Tyr Pro Ala Pro Leu Arg Ala Val Leu Ile
305                      310                      315                      320
Ala Arg Lys Pro


<210> 15
<211> 100
<212> PRT
<213> Xenorhabdus bovienii

<400> 15
Ser Leu Gln Ile Asp Arg Glu Lys Val Gly Leu Asp Arg Tyr Pro Gln
 1               5                      10                      15
Pro Ile Glu Arg Leu Arg Gln Pro Cys Ala Thr Cys Asp Asn His Cys
            20                      25                      30
His Ser Arg His Gln Val Arg Phe Phe Leu Leu Lys Glu Lys Tyr Gly
        35                      40                      45
Ala Ala Leu Ala Pro Ile Ser Ser Gln Ser Ala Ile Arg Tyr Gln Phe
    50                      55                      60
Gln Arg His Thr Met Lys Lys Gly Leu Phe Ala Met Ala Ser Ile Phe
65                      70                      75                      80
Ser Gly Tyr Cys Gly Gly Glu Leu Phe His Leu Leu Thr Asp Pro Ala
                85                      90                      95
His Glu Ser Gln
                100


<210> 16
<211> 267
<212> PRT
<213> Xenorhabdus bovienii

<400> 16
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Ser Ser Phe Arg Leu Asn Asp Asp Leu Leu Thr Asn Ser Tyr Ser Glu
1               5                   10              15
Gly Phe Leu Met Ile Lys Leu Glu Ile Cys Cys Tyr Ser Ile Ser Cys
            20                  25                  30
Ala Leu Val Ala Gln Asn Ala Gly Ala Asp Arg Ile Glu Leu Ser Ala
            35                  40                  45
Ser Pro Leu Glu Gly Gly Leu Thr Pro Ser Phe Gly Ala Leu Gln Gln
    50                  55                  60
Ser Leu Gln Arg Leu Ser Ile Pro Val His Pro Ile Val Arg Pro Arg
65                  70                  75                  80
Gly Gly Asp Phe Cys Tyr Asn Asn Met Asp Phe Glu Ala Met Lys Asn
                85                  90                  95
Asp Val Ala Arg Ile Arg Asp Met Gly Phe Pro Gly Ile Val Phe Gly
            100                 105                 110
Ile Leu Ser Glu Asn Gly His Ile Asp Arg Leu Arg Met Arg Gln Leu
            115                 120                 125
Met Ser Leu Ser Gly Asn Met Ala Val Thr Phe His Arg Ala Phe Asp
    130                 135                 140
Met Cys Phe Asn Pro His Val Ala Leu Glu Gln Leu Thr Glu Leu Gly
145                 150                 155                 160
Val Gln Arg Ile Leu Thr Ser Gly Gln Gln Gln Asn Ala Glu Leu Gly
                165                 170                 175
Leu Thr Leu Leu Lys Glu Leu Met Gln Ala Ser Arg Gly Pro Ile Ile
            180                 185                 190
Met Pro Gly Ala Gly Val Arg Val Ser Asn Ile Ser Lys Phe Leu Glu
            195                 200                 205
Ala Gly Met Thr Glu Val His Ser Ser Ala Gly Lys Ile Val Pro Ser
    210                 215                 220
Thr Met Lys Tyr Arg Lys Val Gly Val Ala Met Ser Ser Asp Asp Arg
225                 230                 235                 240
Asp Val Asp Glu Tyr Ser His Tyr Ser Val Asp Gly Glu Leu Val Glu
                245                 250                 255
Ser Met Lys Gly Val Met Ser Leu Ile Lys Arg
            260                 265
```

<210> 17
<211> 189
<212> PRT
<213> Xenorhabdus bovienii

<400> 17
```
Tyr Phe Gly Lys Asn Arg Arg Phe Val Ile Tyr Val Thr Leu Met Glu
1               5                   10              15
Arg Asn Phe Tyr Gly Leu Phe Asn Gly Glu Glu Met Ser His Phe Ser
            20                  25                  30
Lys Ile Ser Glu Leu Gln Asp Leu Val Ala Asp Leu Ala Gly Phe Glu
            35                  40                  45
Gln Lys Leu Lys Gln Phe Glu Gly His Leu Gly Leu His Phe Glu Gln
    50                  55                  60
Tyr Ser Ala Asp His Ile Ser Leu Arg Cys Asn Glu Ser Lys Ile Ala
65                  70                  75                  80
Asp Arg Trp Arg Lys Gly Phe Leu Gln Cys Gly Gln Leu Ile Ser Glu
            85                  90                  95
Ser Ile Ile Asn Gly Arg Pro Ile Cys Leu Phe Asp Leu Asn Gln Pro
            100                 105                 110
Ile Val Leu Leu Asp Trp Lys Ile Asp Cys Val Glu Leu Pro Tyr Pro
            115                 120                 125
```

Ser Gln Lys His Tyr Val His Gln Gly Trp Glu His Val Glu Leu Val
    130   135   140
Leu Pro Val Pro Pro Glu Gln Leu Ile Cys Glu Ala Lys Lys Leu Leu
145   150   155   160
Pro Gln Pro Leu Pro Asp Asn Phe Arg Met Lys Glu Ser His Pro Lys
                165   170   175
Gly Lys Asn Glu Arg Leu Pro Asn Pro Ile Leu Ala Val
            180   185

<210> 18
<211> 579
<212> PRT
<213> Xenorhabdus bovienii

<400> 18
Gly Asn Thr Val Asn Ile Gln Val Ile Leu Ser Glu Lys Ile Ser Asn
 1   5   10   15
Ala Leu Ile Glu Ala Gly Ala Pro Thr Asp Ser Glu Ala His Val Arg
            20   25   30
Gln Ser Ala Lys Ala Gln Phe Gly Asp Tyr Gln Ala Asn Gly Val Met
        35   40   45
Ala Ala Ala Lys Lys Val Gly Ile Pro Pro Arg Gln Leu Ala Glu Lys
    50   55   60
Val Val Ser Gln Leu Asp Leu Gln Gly Ile Ala Ser Lys Val Glu Ile
65   70   75   80
Ala Gly Pro Gly Phe Ile Asn Ile Phe Leu Asp Lys Ala Trp Val Ala
                85   90   95
Ala Asn Ile Glu Thr Thr Leu Lys Asp Glu Lys Leu Gly Ile Thr Pro
            100   105   110
Val Glu Pro Gln Thr Ile Val Ile Asp Tyr Ser Ala Pro Asn Val Ala
        115   120   125
Lys Gln Met His Val Gly His Leu Arg Ser Thr Ile Ile Gly Asp Ala
    130   135   140
Ala Ala Arg Thr Leu Glu Phe Leu Gly His Lys Val Ile Arg Ala Asn
145   150   155   160
His Val Gly Asp Trp Gly Thr Gln Phe Gly Met Leu Ile Ala Tyr Leu
                165   170   175
Glu Lys Ile Gln Asn Glu Asn Ala Asn Asp Met Ala Leu Ala Asp Leu
            180   185   190
Glu Ala Phe Tyr Arg Glu Ala Lys Lys His Tyr Asp Glu Asp Glu Glu
        195   200   205
Phe Ala Ile Arg Ala Arg Asn Tyr Val Val Lys Leu Gln Gly Gly Asp
    210   215   220
Glu Tyr Cys Arg Lys Met Trp Arg Lys Leu Val Asp Ile Thr Met Ser
225   230   235   240
Gln Asn Gln Glu Thr Tyr Asn Arg Leu Asn Val Thr Leu Thr Glu Lys
                245   250   255
Asp Val Met Gly Glu Ser Leu Tyr Asn Asp Met Leu Pro Gly Ile Val
            260   265   270
Ala Asp Leu Lys Gln Arg Gly Ile Ala Val Lys Ser Asp Gly Ala Thr
        275   280   285
Val Val Tyr Leu Asp Glu Phe Lys Asn Lys Glu Gly Glu Pro Met Gly
    290   295   300
Val Ile Ile Gln Lys Lys Asp Gly Gly Tyr Leu Tyr Thr Thr Thr Asp
305   310   315   320
Ile Ala Cys Ala Lys Tyr Arg His Glu Thr Leu Asn Ala Ser Arg Val
                325   330   335

Leu Tyr Tyr Ile Asp Ser Arg Gln His Gln His Leu Met Gln Ala Trp
     340   345   350

Ala Ile Val Arg Lys Thr Gly Tyr Ile Pro Glu Ser Met Ser Leu Glu
     355   360   365

His His Met Phe Gly Met Met Leu Gly Lys Asp Gly Lys Pro Phe Lys
     370   375   380

Thr Arg Ala Gly Gly Thr Val Arg Leu Ser Asp Leu Leu Asp Glu Ala
385   390   395   400

Ile Glu Arg Ala Asp Thr Leu Ile Arg Glu Lys Asn Pro Asp Met Pro
          405   410   415

Glu Asp Glu Leu Lys Lys Val Val Glu Ala Val Gly Ile Gly Ala Val
          420   425   430

Lys Tyr Ala Asp Leu Ser Lys Ser Arg Thr Thr Asp Tyr Val Phe Asp
     435   440   445

Trp Asp Asn Met Leu Ala Phe Glu Gly Asn Thr Ala Pro Tyr Met Gln
     450   455   460

Tyr Ala Tyr Thr Arg Val Ser Ser Ile Phe Lys Arg Ala Asp Ile Asp
465   470   475   480

Glu Asn Ser Leu Thr Leu Pro Val Met Leu Asn Glu Glu Arg Glu Gln
          485   490   495

Ala Leu Ala Thr Arg Leu Leu Gln Phe Glu Glu Thr Ile Thr Thr Val
          500   505   510

Ala Arg Glu Gly Thr Pro His Val Met Cys Ala Tyr Leu Tyr Asp Leu
     515   520   525

Ala Gly Leu Phe Ser Gly Phe Tyr Glu His Cys Pro Ile Leu Asn Ala
     530   535   540

Asp Ser Glu Glu Leu Arg Gln Ser Arg Leu Lys Leu Ala Leu Leu Thr
545   550   555   560

Ala Lys Thr Leu Lys Gln Gly Leu Asp Thr Leu Gly Ile Gln Thr Val
          565   570   575

Glu Arg Met

<210> 19
<211> 126
<212> PRT
<213> Xenorhabdus bovienii

<400> 19
Ala Gln Val Ser Asn Met His Leu Leu Gly Asp Ile Arg Cys Gly Ile
1   5   10   15

Ile Asp Asn Asp Gly Leu Arg Phe His Trp Gly Asp Thr Glu Leu Phe
          20   25   30

Ile Phe Gln Gly Ser Phe Tyr Ile Cys Cys Asn Pro Arg Phe Ile Lys
     35   40   45

Lys Asn Ile Asp Lys Thr Trp Ala Cys Asn Phe Asn Phe Ala Gly Asn
     50   55   60

Ser Leu Gln Ile Gln Leu Ala Asp Asp Phe Phe Cys Gln Leu Ser Arg
65   70   75   80

Arg Tyr Ser His Leu Phe Ser Gly Ser His His Thr Ile Arg Leu Ile
          85   90   95

Val Thr Lys Leu Cys Phe Gly Arg Leu Thr Asp Val Ser Phe Thr Val
          100   105   110

Gly Trp Ser Ala Ser Phe Asn Gln Arg Ile Ala Asp Phe Phe
     115   120   125

<210> 20

<211> 104
<212> PRT
<213> Xenorhabdus bovienii

<400> 20
His Ala Arg Val Gly Val Leu His Ile Arg Cys Arg Val Ala Phe Lys
1   5   10   15
Gly Gln His Ile Ile Pro Val Glu Asn Ile Val Cys Ser Thr Ala Leu
            20   25   30
Gly Lys Ile Cys Ile Phe His Arg Ala Asn Pro Tyr Arg Phe His Asp
        35   40   45
Phe Phe Gln Phe Val Phe Trp His Ile Trp Val Phe Leu Thr Asn Glu
    50   55   60
Gly Ile Arg Thr Leu Asn Arg Phe Ile Gln Gln Ile Gly Gln Ser Tyr
65   70   75   80
Cys Ala Ala Gly Thr Gly Phe Glu Trp Phe Thr Ile Phe Ala Gln His
            85   90   95
His Ala Lys His Val Val Phe Glu
            100

<210> 21
<211> 120
<212> PRT
<213> Xenorhabdus bovienii

<400> 21
Tyr His Ala Ser Phe Gln Leu Cys Arg Arg Leu Leu His Thr Phe Tyr
1   5   10   15
Ser Leu Asn Thr Gln Ser Ile Lys Thr Leu Leu Gln Ser Phe Arg Cys
            20   25   30
Gln Gln Ser Gln Leu Gln Ala Ala Leu Ala Gln Phe Phe Ala Ile Gly
        35   40   45
Ile Gln Asp Arg Ala Val Leu Ile Glu Thr Arg Glu Gln Thr Gly Gln
    50   55   60
Ile Val Gln Val Cys Thr His Asn Met Trp Arg Thr Phe Thr Gly Asp
65   70   75   80
Gly Ser Asp Arg Phe Phe Lys Leu Gln Gln Ala Gly Cys Gln Cys Leu
            85   90   95
Leu Ala Phe Phe Ile Gln His His Arg Gln Cys Gln Ala Val Phe Ile
            100   105   110
Asp Ile Arg Thr Phe Lys Asp Arg
        115   120

<210> 22
<211> 334
<212> PRT
<213> Xenorhabdus bovienii

<400> 22
Phe Thr Leu Arg Glu Asp Ser Met Ser Asp Trp Thr Gly Val Ser Thr
1   5   10   15
Phe Asn Val Ile Leu Glu Thr Gly Leu Asp Asn Cys Asn Ile Tyr Ala
            20   25   30
Asn Gly Leu Asn Met Ile Gly Val Ile Asn Ile Thr Pro Thr Asp
        35   40   45
Asp Glu Gly Asn Phe Val Asp Ile Asp Asp Val Thr Leu Asn Asp Asn
    50   55   60

```
Ile Lys Ile Val Asp Tyr Ile Asp Gly Ser Asp Ile Asp Gly Ser Asp
65                  70                  75                  80
Gly Trp Phe Tyr Thr Gly Asn Pro Asn Glu Tyr Asn Thr Ile Pro Asn
                85                  90                  95
Ser Gln Ser Tyr Ser Leu Leu Lys Ser Glu Asn Ser Gln Ile Thr Gln
            100                 105                 110
Ile Lys Arg Tyr Val Ser Cys Ser Asn Thr Ser Arg Leu Arg Thr Lys
            115                 120                 125
Ser Phe Ser Ala Lys Val Thr Thr Thr Ser Gly Lys Val Ile Ser Ile
    130                 135                 140
Thr Gln Asn Ser Ile Asn Ser Ser Arg Val Val Ile Asn Ala Ile Asp
145                 150                 155                 160
Ala Thr Asn Phe Thr Asp Asp Glu Leu Arg Thr Thr Lys Glu Thr Arg
                165                 170                 175
Phe Glu Asn Gln Ser Tyr Thr Ser His Lys Ser Ser Thr Asn Ser Leu
            180                 185                 190
Tyr Val His Thr Trp Thr Ile Pro Arg Ser Leu Lys Leu Gln Asn Trp
            195                 200                 205
Arg Trp Glu Asp Tyr Asn Asn Gly Trp Thr Trp Ala Gln Ser Cys Tyr
    210                 215                 220
Tyr Lys Thr Gly Ala Asp Gly Gly Ser Glu Ser Thr Arg Trp Leu Ala
225                 230                 235                 240
Ala Gly Ser Ile Phe Pro Pro Gly Asn Tyr Asp Gly Leu Trp Leu Asp
                245                 250                 255
Asn Asp Ile Ala Leu Ser Gly Met Ala His Lys Ser Tyr Asn Val Asp
            260                 265                 270
Thr Gly Ile Asn Gln Leu Ser Phe Thr Arg Ile Ile Gly Lys Gly Phe
    275                 280                 285
Ser Trp Val Tyr Asn Ile Ser Gly Leu Asp Arg Gly His Ala Val Ile
    290                 295                 300
Ile Ile Asp Gln Tyr Gly Asn Lys Tyr Arg Ile Leu Phe His Ala Gly
305                 310                 315                 320
Tyr Glu Asn Ser Asp Pro Tyr Leu Ser Ser Ser Ile Val Tyr
                325                 330
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<210> 23
<211> 1673
<212> PRT
<213> Xenorhabdus bovienii
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```
<400> 23
Val Tyr Ile Lys Phe Leu Lys Leu Phe Arg Arg Ile Thr Met Ser Asp
1               5                   10                  15
Asn Asn Glu Phe Phe Thr Gln Ala Asn Asn Phe Thr Ser Ala Val Ser
                20                  25                  30
Gly Gly Val Asp Pro Arg Thr Gly Leu Tyr Asn Ile Gln Ile Thr Leu
            35                  40                  45
Gly His Ile Val Gly Asn Gly Asn Leu Gly Pro Thr Leu Pro Leu Thr
    50                  55                  60
Leu Ser Tyr Ser Pro Leu Asn Lys Thr Asp Ile Gly Phe Gly Ile Gly
65                  70                  75                  80
Phe Asn Phe Gly Leu Ser Val Tyr Asp Arg Lys Asn Ser Leu Leu Ser
                85                  90                  95
Leu Ser Thr Gly Glu Asn Tyr Lys Val Ile Glu Thr Asp Lys Thr Val
            100                 105                 110
Lys Leu Gln Gln Lys Lys Leu Asp Asn Leu Arg Phe Glu Lys Asp Leu
            115                 120                 125
```

Lys Glu Asn Cys Tyr Arg Ile Ile His Lys Ser Gly Asp Ile Glu Val
130   135   140
Leu Thr Gly Phe Asn Asn Asn Ala Phe Asp Leu Lys Val Pro Lys Lys
145   150   155   160
Leu Leu Asn Pro Ala Gly His Ala Ile Tyr Ile Asp Trp Asn Phe Glu
                165   170   175
Ala Thr Gln Pro Arg Leu Asn Arg Ile Tyr Asp Asp Leu Asp Gly His
                180   185   190
Asp Ile Pro Leu Leu Asn Leu Glu Tyr Gln Gly Leu Ile Lys Thr Ile
                195   200   205
Leu Thr Leu Phe Pro Gly Gln Lys Glu Gly Tyr Arg Thr Glu Leu Arg
    210   215   220
Phe Leu Asn Arg Gln Leu Asn Ser Ile His Asn Phe Ser Leu Gly Asn
225   230   235   240
Glu Asn Pro Leu Thr Trp Ser Phe Gly Tyr Thr Pro Ile Gly Lys Asn
                245   250   255
Gly Ile Leu Gly Gln Trp Ile Thr Ser Met Thr Ala Pro Gly Gly Leu
                260   265   270
Lys Glu Thr Val Asn Tyr Ser Asn Asn Asn Gln Gly His His Phe Pro
                275   280   285
Gln Ser Ala Asn Leu Pro Val Leu Pro Tyr Val Thr Leu Met Lys Gln
    290   295   300
Val Pro Gly Ala Gly Gln Pro Ala Ile Gln Ala Glu Tyr Ser Tyr Thr
305   310   315   320
Ser His Asn Tyr Val Gly Gly Gly Ser Asn Gly Ile Trp Asn Asn Lys
                325   330   335
Leu Asp Asn Leu Tyr Gly Leu Met Thr Glu Tyr Asn Tyr Gly Ser Thr
                340   345   350
Glu Ser Arg Arg Tyr Lys Asp Lys Glu Gly His Asp Gln Ile Val Arg
    355   360   365
Ile Glu Arg Thr Tyr Asn Asn Tyr His Leu Leu Thr Ser Glu Cys Lys
    370   375   380
Gln Gln Asn Gly Tyr Ile Gln Thr Thr Glu Thr Ala Tyr Tyr Ala Ile
385   390   395   400
Ile Gly His Asn Phe Asp Ser Gln Pro Ser Gln Phe Gln Leu Pro Lys
                405   410   415
Thr Lys Thr Glu Thr Trp Arg Ser Ala Asp Asn Ser Tyr Arg Ser Glu
                420   425   430
Ile Thr Glu Thr Thr Phe Asp Glu Ser Gly Asn Pro Leu Thr Lys Val
    435   440   445
Ile Lys Asp Lys Lys Thr Gln Lys Ile Ile Ser Pro Ser Thr His Trp
    450   455   460
Glu Tyr Tyr Pro Pro Ala Gly Glu Val Asp Asn Cys Pro Pro Glu Pro
465   470   475   480
Tyr Gly Phe Thr Arg Phe Val Lys Lys Ile Ile Gln Thr Pro Tyr Asp
                485   490   495
Ser Glu Phe Lys Asp Asp Pro Glu Lys Phe Ile Gln Tyr Arg Tyr Ser
                500   505   510
Leu Ile Gly Ser Gln Ser His Val Thr Leu Lys Ile Glu Glu Arg His
    515   520   525
Tyr Ser Ala Thr Gln Leu Leu Asn Ser Thr Leu Phe Gln Tyr Asn Thr
    530   535   540
Asp Lys Ser Glu Leu Gly Arg Leu Leu Lys Gln Thr Glu Cys Thr Lys
545   550   555   560
Gly Glu Asn Gly Lys Thr Tyr Ser Val Val His Lys Phe Thr Tyr Thr
                565   570   575
Lys Gln Asp Asp Thr Leu Gln Gln Ser His Ser Ile Thr Thr His Asp

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                580                      585                       590
Asn Phe Thr Ile His Arg Ser Gln Val Arg Ser Arg Tyr Thr Gly Arg
            595                  600                  605
Leu Phe Ser Asp Thr Asp Thr Lys Asp Ile Val Thr Gln Met Ser Tyr
        610                  615                  620
Asp Lys Leu Gly Arg Leu Leu Thr Arg Thr Leu Asn Ser Gly Thr Pro
625                      630                  635                  640
Tyr Ala Asn Thr Leu Thr Tyr Asp Tyr Glu Leu Asn Asn Leu Gln Asp
                645                  650                      655
Asp Asn Arg Pro Pro Phe Val Ile Thr Thr Thr Asp Val Asn Gly Asn
            660                  665                  670
Gln Leu Arg Asn Glu Phe Asp Gly Ala Gly Arg His Val Ser Gln Cys
        675                  680                  685
Leu Lys Asp Ser Asp Gly Asp Gly Lys Phe Tyr Thr Ile His Thr Gln
        690                  695                  700
Gln Tyr Asp Glu Gln Gly Arg His His Thr Ser Thr Tyr Ser Asp Tyr
705                      710                  715                  720
Leu Thr Asn Gly Arg Gln Gln Thr Asp Pro Asp Lys Val His Leu Ser
                725                  730                      735
Met Ser Lys Ser Tyr Asp Asn Trp Gly Gln Ile Ala Asn Thr His Trp
            740                  745                  750
Ser Tyr Gly Val Ser Glu Lys Ile Thr Val Asp Pro Ile Thr Leu Thr
            755                  760                  765
Ala Thr Lys Gln Leu Gln Ser Asn Ser Asn Asn Val Gln Thr Gly Lys
    770                  775                  780
Glu Val Thr Thr Tyr Thr Pro Ser Gln Gln Pro Ile Gln Ile Thr Leu
785                      790                  795                  800
Phe Asp Glu Ala Gly His Leu Gln Ser Cys His Thr Leu Thr Arg Asp
                805                  810                  815
Gly Trp Asp Arg Val Arg Lys Glu Thr Asp Ala Ile Gly Gln Cys Thr
            820                  825                  830
Ile Tyr Gln Tyr Asp Asn Tyr Asn Arg Val Ile Gln Ile Thr Leu Pro
        835                  840                  845
Asp Gly Thr Ile Val Asn Arg Lys Tyr Ala Pro Phe Ser Thr Asp Thr
    850                  855                  860
Leu Ile Thr Asp Ile Arg Val Asn Gly Ile Ser Leu Gly Gln Gln Thr
865                      870                  875                  880
Phe Asp Gly Leu Ser Arg Leu Thr Gln Ser Gln Asp Gly Gly Arg Val
                885                  890                  895
Trp Ala Tyr Thr Tyr Ser Ala Gly Asn Asp Gln Cys Pro Ser Thr Val
            900                  905                  910
Ile Thr Pro Asp Gly Gln Phe Ile His Tyr Gln Tyr Gln Pro Glu Leu
            915                  920                  925
Asp Asp Ala Val Leu Gln Val Ala Ser Asn Glu Ile Thr Gln Gln Phe
        930                  935                  940
Ser Tyr Asn Pro Val Thr Gly Ala Leu Leu Lys Ala Val Ala Glu Gly
945                      950                  955                  960
Gln Ser Leu Thr Pro Ile Tyr Tyr Pro Ser Gly Arg Leu Lys Met Glu
                965                  970                  975
Asn Ile Asn Asp Met Lys Lys Met Ser Tyr Leu Trp Thr Leu Arg Gly
            980                  985                  990
Leu Glu Asn Gly Tyr Thr Asp Leu Thr Gly Thr Ile Gln Lys Ile Ser
        995                  1000                 1005
Arg Asp Thr His Gly Arg Val Thr Gln Ile Lys Asp Ser Ser Ile Lys
        1010                 1015                 1020
Thr Thr Leu Asn Tyr Asp Asp Leu Asn Arg His Ile Gly Ser Gln Val
1025                     1030                 1035                 1040
```

Thr Asp Leu Ala Thr Gly His Met Leu Thr Thr Thr Val Glu Phe Asp
              1045   1050   1055
Gly Leu Asn Arg Glu Ile Gly Arg Lys Leu Cys Asp Ser Ser Gly His
              1060   1065   1070
Thr Leu Asp Ile Gln Gln Ser Trp Leu Lys Thr Gln Gln Leu Ala Asn
              1075   1080   1085
Arg Ile Val Lys Leu Asn Gly Val Leu Gln Arg Thr Glu Gln Tyr Ser
              1090   1095   1100
Tyr Asp Ser Arg Asn Arg Leu Asn Gln Tyr Lys Cys Asp Gly Ala Glu
1105   1110   1115   1120
Cys Pro Thr Asp Lys Tyr Gly His Ser Ile Val Thr Gln Asn Phe Thr
              1125   1130   1135
Tyr Asp Ile Tyr Gly Asn Ile Thr Ala Cys His Thr Thr Phe Ala Asp
              1140   1145   1150
Gly Thr Glu Asp His Ala Thr Phe Lys Phe Ala Asn Pro Thr Asp Pro
              1155   1160   1165
Cys Gln Leu Thr Glu Val His His Thr His Pro Asp Met Pro Asp Asn
              1170   1175   1180
Ile Arg Leu Lys Tyr Asp Lys Ala Gly Arg Val Ile Asn Ile Thr Asp
1185   1190   1195   1200
Asn His Gly Asn Thr Glu Asn Phe Thr Tyr Asp Thr Leu Gly Arg Leu
              1205   1210   1215
Gln Asn Gly Gln Gly Ser Val Tyr Gly Tyr Asp Pro Leu Asn Arg Leu
              1220   1225   1230
Val Ser Gln Lys Thr Asp Thr Leu Asp Cys Glu Leu Tyr Tyr Arg Glu
              1235   1240   1245
Thr Met Leu Val Asn Glu Val Arg Asn Gly Glu Met Ile Arg Leu Leu
              1250   1255   1260
Arg Thr Gly Glu Thr Ile Ile Ala Gln Gln Arg Ala Ser Lys Val Leu
1265   1270   1275   1280
Leu Thr Gly Thr Asp Ser Gln Gln Ser Val Ile Leu Thr Ser Asp Lys
              1285   1290   1295
Gln Asn Leu Ser Gln Glu Ala Tyr Ser Ala Tyr Gly Lys His Lys Ser
              1300   1305   1310
Thr Ala Asn Asp Ala Ser Ile Leu Gly Tyr Asn Gly Glu Arg Ala Asp
              1315   1320   1325
Pro Val Ser Gly Val Thr His Leu Gly Asn Gly Tyr Arg Ser Tyr Asp
              1330   1335   1340
Pro Thr Leu Met Arg Phe His Thr Pro Asp Ser Leu Ser Pro Phe Gly
1345   1350   1355   1360
Ala Gly Gly Ile Asn Pro Tyr Ser Tyr Cys Leu Gly Asp Pro Ile Asn
              1365   1370   1375
Arg Ser Asp Pro Ser Gly His Leu Ser Trp Gln Ala Trp Thr Gly Ile
              1380   1385   1390
Gly Met Gly Ile Ala Gly Leu Leu Leu Thr Ile Ala Thr Gly Gly Met
              1395   1400   1405
Ala Ile Ala Ala Ala Gly Gly Ile Ala Ala Ala Ile Ala Ser Thr Ser
1410   1415   1420
Thr Thr Ala Leu Ala Phe Gly Ala Leu Ser Val Thr Ser Asp Ile Thr
1425   1430   1435   1440
Ser Ile Val Ser Gly Ala Leu Glu Asp Ala Ser Pro Lys Ala Ser Ser
              1445   1450   1455
Ile Leu Gly Trp Val Ser Met Gly Met Gly Ala Ala Gly Leu Ala Glu
              1460   1465   1470
Ser Ala Ile Lys Gly Gly Thr Lys Leu Ala Thr His Leu Gly Ala Phe
              1475   1480   1485
Ala Glu Asp Gly Glu Asn Ala Leu Leu Lys Ser Thr Ser Glu Ser Ser

```
         1490                1495                1500
Arg Ile Lys Trp Gly Val Thr Arg Ser Leu Asp Arg Glu Ile Val Arg
1505                1510                1515                1520
Asn Glu Glu Gly Gln Val Ile Lys Asp His Ser Arg Gly Tyr Thr Asp
                1525                1530                1535
Asn Phe Met Gly Lys Gly Glu Gln Ala Ile Leu Val His Gly Asp Lys
            1540                1545                1550
Asp Gly Phe Leu Tyr His Thr Glu Gly Asn Lys His Asn Gly Lys Gly
        1555                1560                1565
Pro Tyr Thr Arg His Thr Pro Glu Gln Leu Val Asp Tyr Leu Lys Asp
    1570                1575                1580
Asn Asn Ile Val Asp Leu Thr Gln Gly Gly Asp Lys Pro Val His Leu
1585                1590                1595                1600
Leu Ser Cys Tyr Gly Lys Ser Ser Gly Ala Ala Asp Lys Met Ala Lys
                1605                1610                1615
Tyr Ile Asn Arg Pro Val Ile Ala Tyr Ser Asn Lys Pro Thr Ile Ser
            1620                1625                1630
Gln Gly Leu Ala Arg Ile Glu Arg Lys Asp Phe Phe Leu Lys Ser Thr
        1635                1640                1645
Tyr His Ser Tyr Asp Pro Arg Lys Ile Ile Leu Gly Arg Thr Glu Lys
    1650                1655                1660
Thr Val Lys Pro Lys Thr Phe Arg Pro
1665                1670
```

```
<210> 24
<211> 105
<212> PRT
<213> Xenorhabdus bovienii
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```
<400> 24
Leu Cys Tyr Gly His Ile Cys Leu Ser Gly Ile Pro His Arg His Ile
 1               5                  10                  15
Tyr Ile Gly Ser Thr Tyr Tyr Gly Asn Arg Lys Ser Thr Val Leu Tyr
            20                  25                  30
Ala Ala Ile Leu His Ser Val Ser Leu Phe Tyr Leu Leu Ile Ala Val
        35                  40                  45
Phe Ser Ala Ser Ser Ala Gly Tyr Leu Thr Tyr Gly Leu Ser Tyr His
    50                  55                  60
Thr Ile Ser Val Gln Phe Leu Gly Leu Ser His Gln Ile Pro Leu Leu
65                  70                  75                  80
Leu Ser Thr Tyr Asp Gln Ser Leu Asn Leu Leu Leu Asp Tyr Gln Tyr
            85                  90                  95
Gly Asp Ser Gly His Arg Asn Leu Glu
        100                 105
```

```
<210> 25
<211> 129
<212> PRT
<213> Xenorhabdus bovienii
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```
<400> 25
Ser Ala Gln Cys Ile Val Gly Lys Val Phe Arg Ile Ser Met Val Ile
 1               5                  10                  15
Ser Asp Ile Tyr Tyr Ser Thr Ser Leu Ile Ile Phe Gln Pro Asp Ile
            20                  25                  30
Ile Arg His Ile Trp Met Ser Val Val Tyr Leu Cys Gln Leu Ala Trp
        35                  40                  45
```

```
Val Ser Trp Val Gly Lys Phe Glu Gly Ser Met Val Phe Cys Pro Ile
    50                  55                  60
Cys Glu Cys Gly Val Thr Gly Gly Asp Ile Ala Ile Asp Ile Ile Ser
65                  70                  75                  80
Lys Ile Leu Cys Asp Tyr Ala Met Ala Ile Phe Val Cys Arg Ala Phe
                85                  90                  95
Arg Thr Val Thr Phe Ile Leu Val Gln Pro Ile Thr Gly Ile Val Arg
                100                 105                 110
Val Leu Phe Cys Thr Leu Gln Tyr Ser Ile Gln Phe His Tyr Ser Ile
        115                 120                 125
Cys
```

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<210> 26
<211> 141
<212> PRT
<213> Xenorhabdus bovienii

<400> 26
Pro Ser Ser Leu Arg Thr Ile Ser Leu Ser Lys Leu Leu Val Thr Pro
 1               5                  10                  15
His Phe Ile Leu Glu Leu Ser Glu Val Asp Leu Ser Lys Ala Phe Ser
                20                  25                  30
Pro Ser Ser Ala Asn Ala Pro Arg Cys Val Ala Ser Leu Val Pro Pro
        35                  40                  45
Leu Met Ala Asp Ser Ala Asn Pro Ala Ala Pro Ile Pro Ile Glu Thr
    50                  55                  60
His Pro Ser Ile Glu Asp Ala Phe Gly Glu Ala Ser Ser Ser Ala Pro
65                  70                  75                  80
Leu Thr Ile Asp Val Ile Ser Asp Val Thr Leu Ser Ala Pro Asn Ala
                85                  90                  95
Ser Ala Val Val Glu Val Glu Ala Ile Ala Ala Ala Ile Pro Pro Ala
                100                 105                 110
Ala Ala Ile Ala Ile Pro Pro Val Ala Met Val Ser Ser Asn Pro Ala
        115                 120                 125
Ile Pro Met Pro Ile Pro Val His Ala Cys Gln Leu Lys
    130                 135                 140
```

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<210> 27
<211> 101
<212> PRT
<213> Xenorhabdus bovienii

<400> 27
Ala His Cys His Ile Ala Leu Phe Pro Cys Trp His Asn Pro Gln Tyr
 1               5                  10                  15
Cys Gln Gln His Pro Asp His His Ser Asn Cys His His Gln Phe Lys
                20                  25                  30
Gln Glu Tyr Pro Pro Ser Arg Gln Arg Arg Glu Asn Ile Thr Leu Thr
        35                  40                  45
Gln Leu Pro Ile Lys His Thr Gly Ile Glu Ala Gly Ser Gln Thr Asn
    50                  55                  60
Arg Lys Arg Gln Thr Cys Met Phe Gln Arg Ala Asn Glu Ser Lys Val
65                  70                  75                  80
His Gln Leu Gly Gln Asn Gln Gly Arg Asp Arg Asn Phe Tyr Trp Cys
                85                  90                  95
Phe Asp Ile Leu Thr
```

100

<210> 28
<211> 117
<212> PRT
<213> Xenorhabdus bovienii

<400> 28
Pro Gln Ser Thr Pro Ser Ser Gln Asn Ser Arg Gln Leu Thr Pro Ala
 1   5   10   15
Glu Ser Ser Gln His Gln Lys Gln Lys Ser Asp His Ile Glu Ile Met
            20   25   30
Ile Pro Ser Glu Ala Pro Arg Glu Tyr Arg Glu Gln Leu His Lys Ala
        35   40   45
Thr Pro Ala Arg Asn Arg Asp Val Ala Pro Asn Pro Ser Val Phe Asp
    50   55   60
Ile Leu Arg Asp Tyr His Trp Lys Asn Phe Ser Pro Val Lys Ala Ala
65   70   75   80
Lys Ser Ser Leu Thr Pro His Pro Val His Gln Lys Ala Ile Pro Leu
            85   90   95
Asn Asp Gln Arg Asn Thr Ser Met Lys Gln Ser Leu Lys Pro Glu Met
            100   105   110
Arg Gln Lys Leu Tyr
        115

<210> 29
<211> 124
<212> PRT
<213> Xenorhabdus bovienii

<400> 29
Gly Lys Asn Cys Ile Asn Asp Gln Gly Asn Leu Pro Asp Arg Tyr Thr
 1   5   10   15
Gln Asn Cys Arg Pro His Leu Thr Asp Asn Pro Pro Tyr Gly Thr Val
            20   25   30
Thr Glu Arg Asn Pro Arg Gln Tyr Gln His Ala Asp Leu Phe Gln Met
        35   40   45
Arg Lys Leu Ile Gly Gln Leu Gln Asn Pro Ser Gly Asn Asn Gly Pro
    50   55   60
Thr Gln Arg Gln His Trp Arg Ile Ala Ile Arg Ser His Lys Gln Cys
65   70   75   80
Lys Asn Asp His Thr Asp Ile Glu Gln Cys Arg Ser Lys Ser Arg His
            85   90   95
Arg Lys Ala Val Pro Cys Ile Lys Asn Cys Ala Ser Gln Arg Ser Gln
            100   105   110
Arg Asn Gln Lys Asp Ile Arg Lys Arg Asn Ser Lys
        115   120

<210> 30
<211> 515
<212> PRT
<213> Xenorhabdus bovienii

<400> 30
Asn Asn Thr Met Asn Leu Leu Lys Ser Leu Ala Ala Val Ser Ser Met
 1   5   10   15
Thr Met Phe Ser Arg Val Leu Gly Phe Ile Arg Asp Ala Ile Ile Ala

```
                     20                    25                    30
Arg Ile Phe Gly Ala Gly Met Ala Thr Asp Ala Phe Phe Val Ala Phe
             35                    40                    45
Lys Leu Pro Asn Leu Leu Arg Arg Ile Phe Ala Glu Gly Ala Phe Ser
         50                    55                    60
Gln Ala Phe Val Pro Ile Leu Ala Glu Tyr Lys Asn Gln Gln Gly Asp
65                   70                    75                    80
Glu Ala Thr Arg Thr Phe Ile Ala Tyr Ile Ser Gly Met Leu Thr Leu
                 85                    90                    95
Ile Leu Ala Ile Val Ser Val Ile Gly Val Ile Ala Ala Pro Trp Ile
             100                   105                   110
Ile Tyr Val Thr Ala Pro Gly Phe Thr Asp Thr Pro Asp Lys Phe Val
         115                   120                   125
Leu Thr Arg Asp Leu Leu Arg Ile Thr Phe Pro Tyr Ile Phe Leu Ile
         130                   135                   140
Ser Leu Ala Ser Leu Ala Gly Ala Ile Leu Asn Thr Trp Asn Arg Phe
145                   150                   155                   160
Ser Val Pro Ala Phe Ala Pro Thr Leu Leu Asn Val Ser Met Ile Ile
                 165                   170                   175
Phe Ala Leu Phe Val Ala Pro Tyr Cys Asn Pro Pro Val Leu Ala Leu
             180                   185                   190
Gly Trp Ala Val Val Ala Gly Gly Val Leu Gln Leu Ala Tyr Gln Leu
         195                   200                   205
Pro His Leu Lys Lys Ile Gly Met Leu Val Leu Pro Arg Ile Ser Phe
     210                   215                   220
Arg Asp Ser Ala Val Trp Arg Val Ile Arg Gln Met Gly Pro Ala Ile
225                   230                   235                   240
Leu Gly Val Ser Val Gly Gln Ile Ser Leu Ile Ile Asn Thr Ile Phe
                 245                   250                   255
Ala Ser Phe Leu Val Ser Gly Ser Val Ser Trp Met Tyr Tyr Ala Asp
             260                   265                   270
Arg Leu Met Glu Leu Pro Ser Gly Val Leu Gly Val Ala Leu Gly Thr
         275                   280                   285
Ile Leu Leu Pro Ser Leu Ala Lys Ser Phe Ser Ser Gly Asn His Glu
     290                   295                   300
Glu Tyr Arg Lys Leu Met Asp Trp Gly Leu Arg Leu Cys Phe Leu Leu
305                   310                   315                   320
Ala Leu Pro Cys Ala Val Ala Leu Gly Ile Leu Ala Glu Pro Leu Thr
             325                   330                   335
Val Ser Leu Phe Gln Tyr Gly His Phe Ser Ala Phe Asp Ala Glu Met
             340                   345                   350
Thr Gln Arg Ala Leu Ile Ala Tyr Cys Phe Gly Leu Met Gly Leu Ile
             355                   360                   365
Val Val Lys Val Leu Ala Pro Gly Phe Tyr Ser Arg Gln Asp Ile Lys
     370                   375                   380
Thr Pro Val Lys Ile Ala Ile Ala Thr Leu Ile Leu Thr Gln Leu Met
385                   390                   395                   400
Asn Leu Ala Phe Val Gly Pro Leu Lys His Ala Gly Leu Ala Leu Ser
             405                   410                   415
Ile Gly Leu Ala Ala Cys Phe Asn Ala Ser Met Leu Tyr Trp Gln Leu
         420                   425                   430
Arg Lys Arg Asp Ile Phe Thr Pro Leu Ala Gly Trp Gly Ile Phe Leu
         435                   440                   445
Phe Lys Leu Val Val Ala Ile Ala Val Met Val Gly Val Leu Leu Ala
     450                   455                   460
Val Leu Trp Val Met Pro Ala Trp Glu Gln Gly Asn Met Ala Met Arg
465                   470                   475                   480
```

```
Leu Leu Arg Leu Met Gly Val Val Ile Ala Gly Ala Gly Ser Tyr Phe
              485                 490                 495
Ala Val Leu Ala Leu Met Gly Phe Arg Leu Lys Asp Phe Ala His Arg
              500                 505                 510
Gly Leu Gln
        515


<210> 31
<211> 216
<212> PRT
<213> Xenorhabdus bovienii


<400> 31
Ala Ile Ile Leu Ile Arg Asp Lys Leu Ser Arg Ile Phe Ser Arg Gln
  1               5                10                  15
Ile Ser Gly Glu Gly Met Phe Gly Tyr Arg Ser Ala Ser Pro Lys Ile
              20                25                  30
Arg Phe Ile Thr Asp Arg Met Val Val Arg Leu Val Tyr Glu Arg Asp
          35                40                45
Ala Tyr Arg Leu Ala Glu Tyr Tyr Ser Glu Asn Lys Asp Phe Leu Lys
          50                55                60
Pro Trp Glu Pro Thr Arg Asp Gly Ser Phe Tyr Gln Pro Ser Gly Trp
65                  70                75                  80
Thr Asn Arg Leu Asn Tyr Ile Ala Glu Leu Gln Arg Gln Asn Ala Thr
              85                90                  95
Phe Asn Phe Val Leu Leu Asp Ser Asp Glu Arg Glu Ile Met Gly Val
          100               105                 110
Ala Asn Phe Thr Asn Val Val Arg Gly Ala Phe His Ser Cys Tyr Leu
          115               120                 125
Gly Tyr Ser Leu Ala Glu Lys Leu Gln Gly Gln Gly Leu Met Tyr Glu
          130               135               140
Ala Leu Gln Pro Ala Ile Arg Tyr Met Gln Arg Tyr Gln Arg Met His
145               150               155                 160
Arg Ile Met Ala Asn Tyr Met Pro His Asn His Arg Ser Gly Asn Leu
              165               170                 175
Leu Lys Lys Leu Gly Phe Glu Gln Glu Gly Tyr Ala Lys Asn Tyr Leu
              180               185                 190
Met Ile Asp Gly Val Trp Gln Asp His Val Leu Thr Ala Leu Thr Asp
          195               200               205
Asp Ala Trp Gly Lys Val Gly Leu
    210               215


<210> 32
<211> 404
<212> PRT
<213> Xenorhabdus bovienii


<400> 32
Trp Cys Ala Met Ser Leu Val Ser Gln Ala Arg Ser Leu Gly Lys Tyr
  1               5                10                  15
Phe Leu Leu Phe Asp Asn Leu Leu Val Val Leu Gly Phe Phe Val Val
              20                25                  30
Phe Pro Leu Ile Ser Ile Arg Phe Val Glu Gln Leu Gly Trp Ala Ala
          35                40                45
Leu Ile Val Gly Phe Ala Leu Gly Leu Arg Gln Leu Val Gln Gln Gly
          50                55                60
Leu Gly Ile Phe Gly Gly Ala Ile Ala Asp Arg Phe Gly Ala Lys Pro
```

```
65                        70                        75                        80
Met Ile Val Thr Gly Met Leu Leu Arg Ala Leu Gly Phe Ala Leu Met
                    85                        90                        95
Ala Met Ala His Glu Pro Trp Ile Leu Leu Leu Ser Cys Val Leu Ser
                100                       105                       110
Gly Leu Gly Gly Thr Leu Phe Asp Pro Pro Arg Ala Ala Leu Val Ile
                115                       120                       125
Lys Leu Thr Arg Pro His Glu Arg Gly Arg Phe Tyr Ser Ile Leu Met
        130                       135                       140
Met Gln Asp Ser Ala Gly Ala Val Val Gly Ala Leu Ile Gly Ser Trp
145                       150                       155                       160
Leu Leu Gln Tyr Asp Phe Asn Ile Val Cys Trp Ile Gly Ala Ser Ile
                165                       170                       175
Phe Val Leu Ala Ala Leu Phe Asn Ala Trp Leu Leu Pro Ala Tyr Arg
                180                       185                       190
Ile Ser Thr Ile Arg Thr Pro Ile Lys Glu Gly Met Met Arg Val Ile
                195                       200                       205
Arg Asp Arg Arg Phe Leu Tyr Tyr Val Leu Thr Leu Thr Gly Tyr Phe
        210                       215                       220
Val Leu Ser Val Gln Val Met Leu Met Phe Pro Ile Ile Ile His Glu
225                       230                       235                       240
Ile Thr Gly Thr Pro Thr Ala Val Lys Trp Met Tyr Ala Ile Glu Thr
                245                       250                       255
Ala Ile Ser Leu Thr Leu Leu Tyr Pro Ile Ala Arg Trp Ser Glu Lys
                260                       265                       270
His Phe Arg Leu Glu Gln Arg Leu Met Ala Gly Leu Phe Leu Met Ser
                275                       280                       285
Ile Cys Met Phe Pro Ile Gly Trp Val Asn Gln Leu His Thr Leu Phe
                290                       295                       300
Gly Leu Leu Cys Leu Phe Tyr Leu Gly Leu Val Thr Ala Asp Pro Ala
305                       310                       315                       320
Arg Glu Thr Leu Ser Ala Ser Leu Ser Asp Pro Arg Ala Arg Gly Ser
                325                       330                       335
Tyr Met Gly Phe Ser Arg Leu Gly Leu Ala Leu Gly Gly Ala Ile Gly
                340                       345                       350
Tyr Thr Gly Gly Gly Trp Leu Tyr Asp Thr Gly Arg Asp Leu Asn Met
                355                       360                       365
Pro Gln Leu Pro Trp Ile Leu Leu Gly Leu Ser Gly Leu Ile Thr Ile
        370                       375                       380
Tyr Ala Leu His Arg Gln Phe Asn Gln Lys Lys Ile Asp Pro Val Met
385                       390                       395                       400
Leu Gly Arg His
```

```
<210> 33
<211> 191
<212> PRT
<213> Xenorhabdus bovienii

<400> 33
Lys Gly Ala Asn Met Lys Arg Phe Phe Leu Gly Ala Ala Leu Val Leu
 1               5                        10                        15
Val Gly Leu Val Ser Gly Cys Asp Gln Phe Lys Asp Phe Ser Ile Asn
                20                        25                        30
Glu Gly Leu Met Asn Asp Tyr Leu Leu Lys Lys Val His Tyr Gln Lys
            35                        40                        45
Lys Ile Ser Ile Pro Gly Ile Ala Asn Ala Asn Ile Thr Leu Gly Asp
```

```
        50                      55                      60
Leu Ser Ser Gln Ile Gly Arg Gln Asp Pro Glu Lys Ile Glu Leu Ser
65                      70                      75                      80
Thr Gln Ala Lys Val Gln Leu Ala Thr Leu Leu Gly Thr Ile Gln Ala
                    85                      90                      95
Asp Met Lys Leu Thr Ile Lys Ala Lys Pro Val Phe Asp Ala Glu Lys
                100                     105                     110
Gly Ala Ile Phe Val Lys Gly Leu Glu Ile Val Asp Tyr Gln Thr Thr
            115                     120                     125
Pro Glu Lys Ala Ala Ala Pro Val Lys Ala Leu Ile Pro Tyr Leu Asn
        130                     135                     140
Thr Ser Leu Ser Glu Phe Phe Asp Thr His Pro Val Tyr Val Leu Asn
145                     150                     155                     160
Pro Glu Lys Ser Lys Ala Glu Ala Ala Ala Ser Gln Phe Ala Lys Arg
                165                     170                     175
Leu Glu Ile Lys Pro Gly Lys Leu Val Ile Gly Leu Thr Asp Lys
            180                     185                     190
```

<210> 34
<211> 205
<212> PRT
<213> Xenorhabdus bovienii

<400> 34
```
Gln Val Ala Leu Gln His Gly Arg Arg Leu Gly Thr Ile Thr Leu Phe
  1               5                      10                      15
Asp Asn Leu Leu Gly Leu Asn Gln Val Met Asn Glu Phe Ser Ile Val
            20                      25                      30
Cys Arg Ile Leu Gly Thr Leu Phe Asn Arg Ala Pro Gln Asp Pro Val
            35                      40                      45
Leu Gln Pro Leu Ile Thr Met Ile Ala Glu Gly Lys Leu Lys Gln Ala
        50                      55                      60
Trp Pro Leu Glu Gln Asp Glu Trp Leu Asp Arg Leu Gln Gln Asn Ser
65                      70                      75                      80
Glu Leu Ser Val Met Ala Ala Asp Tyr His Ala Leu Phe Thr Gly Glu
                85                      90                      95
Ser Ala Ser Val Ala Val Cys Arg Ser Asp Tyr Thr Asp Gly Glu Glu
                100                     105                     110
Ser Glu Val Arg Gln Phe Leu Thr Glu Arg Gly Met Pro Leu Ser Asp
            115                     120                     125
Thr Pro Ala Asp Gln Phe Gly Ser Leu Leu Leu Ala Val Ser Trp Leu
        130                     135                     140
Glu Asp Gln Ala Ala Glu Asp Glu Ile Gln Ala Gln Ile Thr Leu Phe
145                     150                     155                     160
Asp Glu Tyr Leu Leu Pro Trp Cys Gly Gln Phe Leu Gly Lys Val Glu
                165                     170                     175
Ala His Ala Thr Ser Gly Phe Tyr Arg Thr Leu Ala Ile Val Thr Arg
            180                     185                     190
Glu Ala Leu Gln Ala Leu Arg Asp Glu Leu Glu Ser Glu
            195                     200                     205
```

<210> 35
<211> 315
<212> PRT
<213> Xenorhabdus bovienii

<400> 35

```
Asp Cys Met Asn Ile Ile Phe Phe His Pro Ser Phe Asn Thr Asp Glu
1               5                   10              15
Trp Ile Gln Gly Ile Gln Ala Arg Leu Pro Asp Ala Lys Val Arg Gln
            20              25              30
Trp Val Ser Gly Asp Gln Glu Pro Ala Asp Tyr Ala Leu Val Trp Gln
        35              40              45
Pro Pro Tyr Glu Met Leu Ala Asn Arg Gln Gly Leu Lys Gly Ile Phe
        50              55              60
Ala Leu Gly Ala Gly Val Asp Ala Ile Phe Lys Gln Glu Ser Lys Asn
65              70              75              80
Pro Gly Thr Leu Leu Ala Asp Val Pro Leu Ile Arg Leu Glu Asp Thr
                85              90              95
Gly Met Gly Arg Gln Met Gln Glu Tyr Ala Ile Thr Ser Val Leu His
            100             105             110
Tyr Phe Arg Arg Met Asp Glu Tyr Lys Arg Tyr Gln Glu Gln Arg Leu
        115             120             125
Trp Asn Pro Ile Ala Pro His Asn Arg Lys Glu Phe Val Ile Gly Val
    130             135             140
Leu Gly Ala Gly Ile Leu Gly Arg Ser Val Ile Gly Lys Leu Met Glu
145             150             155             160
Phe Asp Phe Asn Val Arg Cys Trp Ser Arg Thr Ser Lys Gln Leu Asp
            165             170             175
Ser Val Glu Ser Phe Tyr Gly Lys Glu Gln Leu Gly Asp Phe Leu Ser
            180             185             190
Gly Cys Lys Val Leu Ile Asn Leu Leu Pro Asp Thr Pro Asp Thr Arg
    195             200             205
Gly Ile Leu Asn Leu Ser Leu Phe Ser Gln Leu Lys Ser Gly Ser Tyr
    210             215             220
Val Ile Asn Leu Ala Arg Gly Ala Gln Leu Val Glu Gln Asp Leu Leu
225             230             235             240
Val Ala Ile Asp Lys Gly Tyr Ile Ala Gly Ala Thr Leu Asp Val Phe
            245             250             255
Ala Glu Glu Pro Leu Ser Asn Met His Pro Phe Trp Thr His Pro Arg
            260             265             270
Ile Asn Val Thr Pro His Ile Ala Ala Asn Thr Ile Pro Glu Ala Ala
    275             280             285
Met Asp Val Ile Cys Glu Asn Ile Arg Arg Met Val Gln Gly Glu Met
    290             295             300
Pro Thr Gly Leu Val Asp Arg Val Arg Gly Tyr
305             310             315
```

```
Lys Thr Ser Gln Gly Phe Thr Ser Thr Thr Cys Ser Asn Gly Asn Val
1               5                   10              15
Leu Lys Ile Cys Gly Leu Ile Thr Pro Cys Ser Ser Leu Ile Gln Arg
            20              25              30
Thr Tyr Pro Asn Asn Met Thr Ile Gly Ile Phe Ser Lys Glu Ser Thr
        35              40              45
Ala Lys Asn Phe Gly Met Gly Phe Leu Tyr Tyr Phe Asp Leu Arg Val
        50              55              60
Leu Ser Pro Phe Phe Lys Ala Pro Ile Asn Ile Phe Thr Gly Trp Gln
65              70              75              80
```

```
His Asn Thr Asn Phe Arg Lys Ser Arg Asn Ser Thr Ile Arg Leu Cys
                85              90                  95
Ser Ser Thr Pro Asn Ser Lys Gln Tyr Phe Thr Thr Ser Arg Lys Cys
            100             105                 110
His Ile Thr Gly Ala Gly Lys Tyr Arg Phe Ser Ile Glu Asn Cys Phe
        115             120             125
Ile Lys Ser Gly
    130
```

<210> 37
<211> 289
<212> PRT
<213> Xenorhabdus bovienii

<400> 37
```
Tyr Ser Ala Gly Cys Ser Thr Val Leu Lys Ser Ser Leu Asn Leu Gln
  1           5               10                  15
Cys Asp Thr Phe Asn Cys Glu Ser Phe Val Met Leu Thr Leu Asn Phe
            20              25                  30
Ser Thr Ser Val Asn Ala Lys Pro Ser His Ile Trp Ala His Tyr Val
            35              40                  45
Asp Phe Asp Leu Arg Lys Lys Trp Glu Val Asp Leu Glu Tyr Phe Gln
    50              55                  60
Phe Glu Gly Glu Val Lys Thr Gly Gln Tyr Gly Arg Met Ile Leu Ser
65              70                  75                  80
Gly Met Pro Glu Ile Arg Phe Tyr Leu Ser Asn Ile Glu Val Asn Lys
            85              90                  95
Glu Phe Thr Asp Gln Val Asn Leu Pro Gln Met Gly Ile Leu Thr Phe
            100             105                 110
Arg His Gln Ile Ile Thr Asp Glu Asn Asn Met Ala Cys Arg Val Gln
        115             120             125
Val Thr Val Ser Phe Glu Pro Asp Ala Asn Ile Pro Ala Val Gln Ala
    130             135             140
Glu Ser Phe Phe Lys Gln Gly Thr Gln Asp Leu Val Glu Ser Val Leu
145             150             155                 160
Arg Leu Lys Ser Val Val Glu Thr Val Ser Pro Lys Pro Asn Leu Gln
            165             170                 175
Leu Val Tyr Val Ser Asp Ile Glu Ser Ser Thr Ala Phe Tyr Lys Thr
            180             185                 190
Ile Phe Asn Ala Glu Pro Ile Phe Ala Ser Ser Arg Tyr Val Ala Phe
            195             200             205
Pro Ala Gly Gly Glu Val Leu Phe Ala Ile Trp Ser Gly Gly Ala Lys
    210             215             220
Pro Asp Arg Ala Ile Pro Arg Phe Ser Glu Ile Gly Ile Met Leu Pro
225             230             235                 240
Ser Gly Lys Asp Val Asp Arg Cys Phe Glu Glu Trp Arg Lys Asn Pro
            245             250                 255
Glu Ile Lys Ile Val Gln Glu Pro His Thr Glu Val Phe Gly Arg Thr
            260             265                 270
Phe Leu Ala Glu Asp Pro Asp Gly His Ile Ile Arg Val Cys Pro Leu
        275             280             285
Asp
```

<210> 38
<211> 270
<212> PRT

<213> Xenorhabdus bovienii

<400> 38
```
Lys Gly Asn Gln Ile Thr Met Ile Leu Tyr Lys Gly Ser Lys Asn Tyr
1               5                   10              15
Leu Phe Asn Gln Leu Asn Tyr Asp Ser Cys Val Leu Leu Glu Val Asp
            20                  25              30
Glu Ser Val Asn Leu Asn Gly Trp Asp Glu Leu Ser Arg Ala Gln Arg
        35                  40                  45
Leu Leu Phe Leu Met Glu Ile Leu Arg Arg Tyr His Phe Pro Val Gln
    50                  55                  60
Gly Lys Val Leu Ala Gln Lys Leu Asn Ile Ser Leu Arg Thr Leu Tyr
65                  70                  75              80
Arg Asp Ile Ala Ser Leu Gln Ala Gln Gly Ala Ile Ile Glu Gly Glu
                85                  90                  95
Pro Gly Ile Gly Tyr Val Leu Arg Pro Gly Phe Val Leu Pro Pro Leu
            100                 105                 110
Met Phe Thr Gln Asn Glu Ile Glu Ala Leu Ala Leu Gly Ala Asn Trp
        115                 120                 125
Val Ala Lys Arg Ala Asp Pro Gln Leu Lys Glu Ser Ala Asn Asn Ala
    130                 135                 140
Ile Ser Lys Ile Ala Ala Val Ile Pro Ala Glu Leu Lys Gln Met Leu
145                 150                 155                 160
Glu Ala Ser Ser Leu Leu Ile Gly Pro Ala Ala Thr Ala Val Gln Pro
                165                 170                 175
Val Val Glu Ile Gln Gln Ile Arg Gln Ala Ile Asn Thr Arg His Lys
            180                 185                 190
Ile Thr Leu Ala Tyr Leu Asp Ile Lys Asp Ile Pro Ser Glu Arg Thr
        195                 200                 205
Ile Trp Pro Phe Ala Leu Gly Tyr Phe Glu Asn Ile Ser Ile Val Ile
    210                 215                 220
Gly Trp Cys Glu Leu Arg Glu Glu Phe Arg His Phe Arg Ser Asp Arg
225                 230                 235                 240
Ile Met Arg Leu Lys Ile Glu Asn Gln Cys Tyr Pro Arg Ser Arg Gln
                245                 250                 255
Val Leu Leu Lys Glu Trp Arg Ala Met Glu Lys Ile Ser Arg
                260                 265                 270
```

<210> 39
<211> 209
<212> PRT
<213> Xenorhabdus bovienii

<400> 39
```
Arg Lys Met Thr Ile Tyr Asp Leu Lys Pro Arg Phe Gln Asn Leu Leu
1               5                   10              15
Arg Pro Ile Val Ile Tyr Leu Tyr Lys Gln Gly Ile Thr Ala Asn Gln
            20                  25              30
Val Thr Leu Thr Ala Leu Phe Leu Ser Ile Phe Ala Gly Ser Leu Leu
        35                  40                  45
Ser Leu Phe Pro Ser Pro His Leu Tyr Trp Leu Leu Pro Val Phe Leu
    50                  55                  60
Phe Ile Arg Met Ala Leu Asn Ala Ile Asp Gly Met Leu Ala Arg Glu
65                  70                  75              80
His Asn Gln Lys Ser His Leu Gly Ala Ile Tyr Asn Glu Leu Gly Asp
                85                  90                  95
Val Ile Ser Asp Val Ala Leu Tyr Leu Pro Phe Cys Leu Leu Pro Asp
```

```
                100  ·                    105                     110
Val Asn Ser Leu Ser Leu Leu Ile Ile Leu Phe Leu Thr Ile Leu Thr
        115                    120                     125
Glu Phe Ile Gly Val Leu Ala Gln Thr Ile Gly Ala Ser Arg Arg Tyr
    130                    135                 140
Asp Gly Pro Ile Gly Lys Ser Asp Arg Ala Phe Ile Phe Gly Ala Tyr
145                    150                 155                 160
Gly Leu Ile Ile Ala Ile Phe Pro Leu Ala Leu Gly Trp Ser Ile Ser
                165                    170                 175
Leu Phe Ala Phe Met Ile Ile Leu Leu Leu Val Thr Cys Tyr Gln Arg
                180                    185                 190
Val Val Lys Ala Leu Arg Glu Ile Arg Leu Ala Glu Gln Ser His Ser
            195                    200                 205
Lys
```

```
<210> 40
<211> 592
<212> PRT
<213> Xenorhabdus bovienii

<400> 40
Gly Val Asn Met Thr Pro Gln Leu Asp Gln Arg Ile Ala Glu Glu His
  1                5                    10                  15
Tyr Phe Thr Thr Ser Asp Asn Ala Ser Leu Phe Tyr Arg Tyr Trp Pro
            20                    25                  30
Gln Gln Gln Ala Asn Pro Asp Arg Ala Ile Ile Ile Phe His Arg Gly
        35                    40                  45
His Glu His Ser Gly Arg Ile Gln His Val Val Asp Gly Leu Asp Leu
    50                    55                  60
Pro Asp Val Pro Met Phe Ala Trp Asp Ala Arg Gly His Gly Lys Thr
65                    70                    75                  80
Glu Gly Pro Arg Gly Tyr Ser Pro Ser Met Gly Thr Ser Ile Arg Asp
                85                    90                  95
Val Asp Glu Phe Val Arg Phe Ile Ala Thr Gln Tyr Gly Ile Ala Met
            100                    105                 110
Glu Asn Ile Val Val Ile Gly Gln Ser Val Gly Ala Val Leu Val Ser
        115                    120                 125
Ala Trp Val His Asp Tyr Ala Pro Lys Ile Arg Ala Met Ile Leu Ala
    130                    135                 140
Ala Pro Ala Phe Asp Ile Lys Leu Tyr Ile Pro Phe Ala Thr Gln Gly
145                    150                 155                 160
Leu Gln Leu Met Gln Lys Ala Arg Gly Ile Phe Phe Val Asn Ser Tyr
                165                    170                 175
Val Lys Ala Arg Tyr Leu Thr His Asp Glu Thr Arg Ile Ala Ser Tyr
            180                    185                 190
Asn Ser Asp Pro Leu Ile Thr Arg Glu Ile Ala Val Asn Ile Leu Leu
        195                    200                 205
Asp Leu Tyr Gln Thr Ala Glu Arg Val Val Lys Asp Ala Ala Ala Ile
    210                    215                 220
Thr Leu Pro Thr Leu Leu Phe Ile Ser Gly Ser Asp Tyr Val Val Asn
225                    230                 235                 240
Lys Lys Pro Gln His Gln Phe Tyr Gln Gln Leu Asn Thr Pro Ile Lys
                245                    250                 255
Glu Lys His Val Met Asp Gly Phe Tyr His Asp Thr Leu Gly Glu Lys
            260                    265                 270
Asp Arg His Leu Val Phe Asp Lys Ile Arg Val Phe Ile Glu Arg Ile
```

```
             275                    280                      285
Phe Ala Leu Pro Arg Tyr Gln His Asp Tyr Ser Gln Glu Asp Thr Trp
     290                    295                      300
Ser His Ser Ala Asp Glu Phe Arg Thr Leu Ser Thr Ser Leu Pro Cys
305                    310                      315                    320
Leu Cys Pro Lys Lys Leu Ser Tyr Gln Leu Met Arg Lys Val Met Ser
                    325                    330                      335
Thr His Trp Gly Arg Thr Ser Glu Gly Val Cys Ile Gly Leu Lys Thr
                    340                    345                      350
Gly Phe Asp Ser Gly Ser Thr Leu Asp Tyr Val Tyr Arg Asn Gln Pro
                    355                    360                      365
Gln Gly Lys Gly Ile Leu Gly Arg Ile Leu Asp Lys His Tyr Leu Asn
     370                    375                      380
Ser Ile Gly Trp Arg Gly Ile Arg Gln Arg Lys Ile His Ile Glu Met
385                    390                      395                    400
Leu Ile Arg His Ala Ile Arg Ser Leu Arg Glu Gln Asn Met Pro Val
                    405                    410                      415
His Met Val Asp Ile Ala Ala Gly His Gly Arg Tyr Ile Leu Asp Ala
                    420                    425                      430
Ile Asn Asp Phe Ser Lys Val Asp Ser Ile Leu Leu Arg Asp Tyr Ser
                    435                    440                      445
Glu Ile Asn Val Asn Gln Gly Gln Ala Tyr Ile Glu Glu Arg Asp Leu
     450                    455                      460
Thr Asp Lys Ile Arg Phe Ile Ile Gly Asp Ala Phe Asn Ala Glu Ser
465                    470                      475                    480
Ile Ser Ser Ile Thr Pro Ala Pro Thr Leu Gly Ile Val Ser Gly Leu
                    485                    490                      495
Tyr Glu Leu Phe Pro Asp Asn Asn Leu Leu Arg Asn Ser Leu Arg Gly
                    500                    505                      510
Phe Ala Asp Val Met Thr Glu Asn Gly Tyr Leu Val Tyr Thr Gly Gln
                    515                    520                      525
Pro Trp His Pro Gln Ile Glu Val Ile Ala Arg Val Leu Ser Ser His
     530                    535                      540
Arg Asp Ser Gln Pro Trp Ile Met Arg Arg Arg Thr Gln Gly Glu Met
545                    550                      555                    560
Asp Ala Leu Val Glu Ala Ala Gly Phe Glu Lys Leu Tyr Gln Leu Thr
                    565                    570                      575
Asp Asn Trp Gly Ile Phe Thr Val Ser Ile Ala Lys Arg Val His Arg
                    580                    585                      590
```

`<210> 41`
`<211> 121`
`<212> PRT`
`<213> Xenorhabdus bovienii`

`<400> 41`

```
His His Asn Ser Ile Asn Val Leu Leu Lys Asn Ile Ile Ser Pro His
  1               5                   10                  15
Gln Ile Met Leu Leu Cys Phe Thr Val Thr Gly His Asn Asn Arg Pro
               20                  25                  30
Ile Gln Thr Glu Arg Ser Leu Phe Phe Thr Val Val Met Ser Thr Gln
               35                  40                  45
Asp Val Ser Ser Met Ser Leu Thr Asp Ser Ile Cys Leu Met Phe Leu
     50                  55                  60
Cys Ser Arg Gly Met Pro Val Asp Thr Val Arg Gln Lys Gly Arg Ala
65                  70                  75                  80
Val Thr Ala His Pro Trp Glu Arg Arg Phe Val Met Leu Met Asn Leu
```

```
                        85                      90                      95
Ser Asp Leu Leu Pro Leu Ser Thr Ala Ser Pro Trp Lys Ile Ser Trp
            100                     105                 110
Leu Ser Ala Arg Val Ser Glu Arg Tyr
            115                     120
```

<210> 42
<211> 444
<212> PRT
<213> Xenorhabdus bovienii

<400> 42
```
Ile Asn Lys Tyr Lys Met Glu His His Met His Ser Ser Leu Asp Ser
 1               5                   10                  15
Arg Arg Arg Leu Trp Leu Thr Gly Val Ile Trp Leu Leu Phe Leu Ala
            20                      25                  30
Pro Phe Phe Phe Leu Thr Tyr Gly Gln Val Asn Gln Phe Thr Ala Gln
            35                      40                  45
Arg Ser Asp Val Gly Thr Val Met Phe Gly Trp Glu His Asn Ile Pro
            50                      55                  60
Phe Trp Ser Trp Ser Ile Ile Pro Tyr Trp Ser Ile Asp Leu Phe Tyr
65                      70                  75                  80
Gly Ile Ser Leu Phe Ile Cys Thr His Arg Arg Glu Gln Trp Leu His
                85                      90                  95
Gly Trp Arg Leu Met Thr Ala Ser Leu Ile Ala Cys Val Gly Phe Leu
            100                     105                 110
Leu Phe Pro Leu Lys Phe Ser Phe Ser Arg Pro Thr Thr Glu Gly Leu
            115                     120                 125
Phe Gly Trp Leu Phe Asn Gln Leu Glu Leu Phe Asp Leu Pro Tyr Asn
            130                     135                 140
Gln Ala Pro Ser Leu His Ile Ile Leu Leu Trp Leu Leu Trp Leu Arg
145                     150                 155                 160
Tyr Ser Ala Tyr Val Ser Gly Tyr Trp Arg Gly Leu Leu His Ile Trp
                165                     170                 175
Ser Val Leu Ile Ala Leu Ser Val Leu Thr Thr Trp Gln His His Phe
                180                     185                 190
Ile Asp Val Leu Thr Gly Phe Ala Val Gly Val Ile Leu Ser Tyr Leu
                195                     200                 205
Leu Pro Val Ser Tyr Arg Trp Arg Trp Gln Pro Asn Gln Asp Arg Tyr
            210                     215                 220
Ala Arg Lys Leu Phe Gly Tyr Tyr Leu Thr Gly Ser Ala Leu Phe Ala
225                     230                 235                 240
Leu Ile Ala Ser Leu Leu Gly Gly Ser Phe Trp Ile Leu Leu Trp Pro
                245                     250                 255
Ala Val Ser Leu Leu Met Ile Ala Leu Gly Tyr Ala Gly Leu Gly Ser
                260                     265                 270
Ser Val Phe Gln Lys Gln Pro Asp Gly Arg Met Ser Leu Ser Ala Arg
            275                     280                 285
Trp Leu Leu Ala Pro Tyr Gln Leu Gly Ala Trp Leu Ser Tyr Leu Trp
            290                     295                 300
Phe Arg Arg Lys Ser Ala Pro Phe Asn His Ile Thr Glu Gly Ile Ile
305                     310                 315                 320
Leu Gly Ser Leu Pro Cys Gln Pro Val Thr Ala Val Ser Val Leu Asp
                325                     330                 335
Ile Thr Ala Glu Trp His Arg Arg Ser Asp Ala Arg Thr Val Asn Tyr
                340                     345                 350
Val Cys Gln Pro Gln Ile Asp Leu Leu Pro Leu Ala Pro Glu Ala Leu
```

```
            355                  360                  365
Gln Ser Ala Val Cys Thr Leu Asp Lys Leu Arg Gln Gln Gly Asp Val
    370                  375                  380
Phe Val His Cys Thr Leu Gly Leu Ser Arg Ser Ala Met Val Val Ala
385                  390                  395                  400
Ala Trp Leu Leu Lys Gln His Pro Glu Tyr Asp Ile Asn Thr Val Val
                405                  410                  415
Ala Ile Leu Arg Lys Ala Arg Pro His Val Thr Phe Arg Gln Thr His
            420                  425                  430
Leu Asp Ala Leu Ser Gln Trp Ala Lys Gly Tyr Leu
            435                  440
```

<210> 43
<211> 174
<212> PRT
<213> Xenorhabdus bovienii

<400> 43

```
Gln Ser Cys Val Lys Pro Asp Arg Met Ser Arg Ser Asp Lys His Ile
 1               5                  10                  15
Trp Met Pro Cys Leu Asn Gly Gln Lys Ala Thr Tyr Asn Gly Glu His
            20                  25                  30
Asn Met Gln Pro Glu Asn Leu Ile Ser Lys Val Ile Ile Ala Thr Leu
        35                  40                  45
Lys Ser Trp Arg Phe Ile Ser Thr Leu Ser Ala Phe Ser Ile Leu Ile
    50                  55                  60
Ala Thr Ala Met Leu Ile Ala Val Phe Asn Thr Thr Ala Leu Asn Asn
65                  70                  75                  80
Ile Ala Leu Tyr Ala Val Leu Leu Phe Thr Thr Leu Tyr Cys Gln Tyr
                85                  90                  95
Tyr Cys Trp Arg Thr Trp Leu Asp Cys His Tyr Phe Gln Ile Leu Asn
            100                 105                 110
Ser Ser Pro Glu Lys Ser Ala Glu Phe Asp Gln Thr Leu Leu Leu Ile
        115                 120                 125
Phe Asn Lys Leu Pro Gln Ser Arg Thr Gln Asn Asp Arg Phe Asn Gly
    130                 135                 140
Ala Ile Lys Leu Leu Lys Lys Ala Thr Ile Gly Leu Ile Leu Gln Trp
145                 150                 155                 160
Ile Leu Phe Phe Leu Phe Leu Leu Thr Leu Lys Tyr Ser Ala
                165                 170
```

<210> 44
<211> 466
<212> PRT
<213> Xenorhabdus bovienii

<400> 44

```
Met Asn Thr Arg Lys Ile Asn Gly Ile Arg Pro Phe Ser Ala Phe Ile
 1               5                  10                  15
Asp Ser Cys Leu Lys Glu Ser Tyr Ser Phe Pro Arg Phe Ile Arg Asp
            20                  25                  30
Ile Ile Ala Gly Ile Thr Val Gly Val Ile Ala Ile Pro Leu Ala Met
        35                  40                  45
Ala Leu Ala Ile Gly Ser Gly Val Ala Pro Gln Tyr Gly Leu Tyr Thr
    50                  55                  60
Ala Ala Ile Ala Gly Ile Val Ile Ala Met Thr Gly Gly Ser Arg Tyr
65                  70                  75                  80
```

Ser Val Ser Gly Pro Thr Ala Ala Phe Val Val Ile Leu Tyr Pro Val
85   90   95

Ser Gln Gln Phe Gly Leu Ser Gly Leu Leu Ile Ala Thr Leu Met Ser
100   105   110

Gly Val Ile Leu Ile Val Met Gly Leu Ala Arg Phe Gly Arg Leu Ile
115   120   125

Glu Tyr Ile Pro Met Ser Val Thr Leu Gly Phe Thr Ser Gly Ile Ala
130   135   140

Ile Thr Ile Ala Thr Met Gln Val Gln Asn Phe Phe Gly Leu Lys Leu
145   150   155   160

Ala His Ile Pro Glu Asn Tyr Ile Asp Lys Val Val Ala Leu Tyr Gln
165   170   175

Ala Leu Pro Ser Leu Gln Leu Ser Asp Thr Leu Ile Gly Leu Thr Thr
180   185   190

Leu Leu Val Leu Ile Phe Trp Pro Lys Leu Gly Val Lys Leu Pro Gly
195   200   205

His Leu Pro Ala Leu Ile Ala Gly Thr Ala Val Met Gly Ala Met His
210   215   220

Leu Leu Asn His Asp Val Ala Thr Ile Gly Ser Ser Phe Ser Tyr Thr
225   230   235   240

Leu Ala Asp Gly Thr Gln Gly Gln Gly Ile Pro Pro Ile Leu Pro Gln
245   250   255

Phe Val Leu Pro Trp Asn Leu Pro Asp Thr His Ser Leu Asp Ile Ser
260   265   270

Trp Asn Thr Val Ser Ala Leu Leu Pro Ala Ala Phe Ser Met Ala Met
275   280   285

Leu Gly Ala Ile Glu Ser Leu Leu Cys Ala Val Ile Leu Asp Gly Met
290   295   300

Thr Gly Lys Lys His His Ser Asn Gly Glu Leu Leu Gly Gln Gly Leu
305   310   315   320

Gly Asn Ile Ala Ala Pro Phe Phe Gly Gly Ile Thr Ala Thr Ala Ala
325   330   335

Ile Ala Arg Ser Ala Ala Asn Val Arg Ala Gly Ala Thr Ser Pro Ile
340   345   350

Ala Ala Val Val His Ser Leu Leu Val Leu Leu Thr Leu Leu Val Leu
355   360   365

Ala Pro Met Leu Ser Tyr Leu Pro Leu Ala Ala Met Ser Ala Ile Leu
370   375   380

Leu Ile Val Ala Trp Asn Met Ser Glu Ala His Lys Val Val Asp Leu
385   390   395   400

Ile Arg His Ala Pro Lys Asp Asp Ile Ile Val Met Leu Leu Cys Leu
405   410   415

Ser Leu Thr Val Leu Phe Asp Met Val Arg Arg Asp His Tyr Arg His
420   425   430

Cys Ala Gly Ile Thr Pro Val Tyr Ala Gln Asn Cys Gln Tyr Asp Ser
435   440   445

Asn Gln His Val Ile Phe Asn Lys Arg Gly Glu Arg Val Ile Gly Arg
450   455   460

Thr Asn
465

<210> 45
<211> 125
<212> PRT
<213> Xenorhabdus bovienii

<400> 45

```
Glu Ser Ile Gly Ala Lys Thr Ser Asn Val Asn Asn Thr Ser Arg Glu
1               5                   10                  15
Cys Thr Thr Ala Ala Ile Gly Glu Val Ala Pro Ala Arg Thr Leu Ala
            20                  25                  30
Ala Glu Arg Ala Ile Ala Ala Val Ala Val Met Pro Pro Lys Lys Gly
        35                  40                  45
Ala Ala Ile Leu Pro Asn Pro Trp Pro Ser Ser Ser Pro Leu Glu Trp
    50                  55                  60
Cys Phe Phe Pro Val Ile Pro Ser Arg Ile Thr Ala His Ser Asn Asp
65                  70                  75                  80
Ser Ile Ala Pro Ser Met Ala Ile Glu Asn Ala Ala Gly Ser Asn Ala
                85                  90                  95
Asp Thr Val Phe Gln Leu Ile Ser Arg Glu Cys Val Ser Gly Lys Phe
            100                 105                 110
His Gly Arg Thr Asn Trp Gly Arg Met Gly Gly Met Pro
            115                 120                 125
```

<210> 46
<211> 161
<212> PRT
<213> Xenorhabdus bovienii

<400> 46
```
Leu Ser Tyr Ser Ile Trp Ser Val Ala Ile Thr Ile Gly Ile Val Leu
1               5                   10                  15
Ala Ser Leu Leu Phe Met Arg Lys Ile Ala Asn Met Thr Arg Ile Ser
            20                  25                  30
Thr Ser Ser Leu Thr Ser Ala Glu Lys Gly Leu Leu Val Val Arg Ile
        35                  40                  45
Asn Gly Pro Leu Phe Phe Ala Ala Ala Glu Arg Ile Phe Ala Glu Leu
    50                  55                  60
Arg Glu Lys Ser Ala Asp Tyr Gln Thr Ile Ile Met Gln Trp Asp Ala
65                  70                  75                  80
Val Pro Val Leu Asp Ala Gly Gly Leu His Ala Phe Gln Gly Phe Val
                85                  90                  95
Arg Glu Leu Gly Lys Glu Lys His Ile Val Val Cys Asp Ile Pro Phe
            100                 105                 110
Gln Pro Leu Lys Thr Leu Ala Arg Ala Lys Val Met Pro Ile Glu Gly
            115                 120                 125
Glu Leu Ser Phe Tyr Ala Thr Leu Pro Lys Ala Leu Lys Glu Met Ala
    130                 135                 140
Val Asp Tyr Thr Pro Glu Val Cys Ala Ser Ser Glu Lys Ile Gln Gly
145                 150                 155                 160
Gln
```

<210> 47
<211> 173
<212> PRT
<213> Xenorhabdus bovienii

<400> 47
```
Cys Met Ser Asp Val Glu Asn Asp Arg Arg Thr Leu Gly Ser Leu Leu
1               5                   10                  15
His Asp Thr Glu Ala Gln His Val Asn His Gln Ile Val Ile Thr Lys
            20                  25                  30
Val Ala Ala Thr Val Thr Gln Asp His Leu Val Ile Ala Ala Phe Phe
```

```
              35                      40                      45
Glu Phe Phe Asn Asn Ile Ala His Leu Pro Arg Ala Asn Lys Leu Trp
        50                      55                      60
Phe Phe Asn Ile Asn His Ser Thr Gly Phe Arg His Arg Phe Asn Gln
65                      70                      75                      80
Ile Gly Leu Ala Gly Lys Glu Gly Trp Lys Leu Asn His Ile His His
                85                      90                      95
Ile Arg Asp Trp Leu Ser Leu Cys Arg Leu Met His Val Ser Asp Asn
            100                     105                     110
Phe His Ala Glu Gly Leu Phe Gln Phe Leu Lys Asp Phe His Pro Leu
            115                     120                     125
Phe Gln Pro Trp Pro Thr Ile Arg Ala Asp Arg Arg Thr Val Ser Leu
        130                     135                     140
Ile Lys Arg Arg Phe Lys Asn Ile Arg Asn Ala Gln Phe Leu Cys His
145                     150                     155                     160
Gly Asp Ile Val Leu Thr Asn Pro His Gly Gln Ile Pro
                165                     170


<210> 48
<211> 308
<212> PRT
<213> Xenorhabdus bovienii


<400> 48
Leu Ser Cys Ile Arg Phe Ile Phe Leu Leu Ile Gln Gln Ile Tyr Leu
 1               5                      10                      15
Pro Leu Thr Arg Glu Gly Ile Ser Met Gln Gln Lys Val Val Asn Ile
            20                      25                      30
Gly Asp Ile Lys Val Ala Asn Asp Leu Pro Phe Val Leu Phe Gly Gly
        35                      40                      45
Met Asn Val Leu Glu Ser Arg Asp Leu Ala Met Arg Ile Cys Glu His
        50                      55                      60
Tyr Val Thr Val Thr Gln Lys Leu Gly Ile Pro Tyr Val Phe Lys Ala
65                      70                      75                      80
Ser Phe Asp Lys Ala Asn Arg Ser Ser Ile Arg Ser Tyr Arg Gly Pro
                85                      90                      95
Gly Leu Glu Glu Gly Met Lys Ile Phe Gln Glu Leu Lys Gln Thr Phe
            100                     105                     110
Gly Val Lys Ile Ile Thr Asp Val His Glu Pro Ala Gln Ala Gln Pro
            115                     120                     125
Val Ala Asp Val Val Asp Val Ile Gln Leu Pro Ala Phe Leu Ala Arg
            130                     135                     140
Gln Thr Asp Leu Val Glu Ala Met Ala Lys Thr Gly Ala Val Ile Asn
145                     150                     155                     160
Val Lys Lys Pro Gln Phe Val Ser Pro Gly Gln Met Gly Asn Ile Val
                165                     170                     175
Glu Lys Phe Lys Glu Gly Gly Asn Asp Gln Val Ile Leu Cys Asp Arg
            180                     185                     190
Gly Ser Asn Phe Gly Tyr Asp Asn Leu Val Val Asp Met Leu Gly Phe
            195                     200                     205
Gly Val Met Gln Gln Ala Thr Gln Gly Ala Pro Val Ile Phe Asp Val
            210                     215                     220
Thr His Ala Leu Gln Cys Arg Asp Pro Leu Gly Ala Ala Ser Gly Gly
225                     230                     235                     240
Arg Arg Ala Gln Val Ala Glu Leu Ala Arg Ala Gly Met Ala Val Gly
                245                     250                     255
Ile Ala Gly Leu Phe Leu Glu Ala His Pro Asp Pro Glu Asn Ala Lys
```

```
                    260                    265                    270
Cys Asp Gly Pro Ser Ala Leu Pro Leu Ala Lys Leu Glu Ser Phe Leu
        275                    280                    285
Met Gln Ile Lys Ala Ile Asp Asp Val Val Lys Asn Phe Pro Glu Leu
        290                    295                    300
Asp Thr Ser Lys
305
```

<210> 49
<211> 274
<212> PRT
<213> Xenorhabdus bovienii

<400> 49

```
Val Asp Gly Ile Lys Met Lys Pro Ile Val Asn Tyr Glu Phe Asn Asn
 1               5                    10                   15
Thr Pro Leu Ile Asp Gly Ile Ile Leu Val Ser Lys Ile Ile Arg Pro
            20                   25                   30
Asp Phe Pro Gln Thr Leu Val Ser Glu Gln Leu Thr Ala Leu Val Glu
            35                   40                   45
Glu Ala Arg Gln Arg Leu Ser Ser Ile Thr Asp Ser Lys Val Lys Leu
        50                   55                   60
Asp Ser Leu Leu Thr Leu Phe Tyr Arg Glu Trp Lys Phe Gly Gly Ala
65                   70                   75                   80
Asn Gly Val Tyr Cys Leu Ser Asp Thr Leu Trp Leu Asp Arg Leu Leu
                85                   90                   95
His Ser Arg Gln Gly Ser Pro Val Ser Leu Gly Thr Val Phe Thr His
            100                  105                  110
Ile Ala Gln Ala Leu Gly Leu Ser Val Gln Pro Val Ile Phe Pro Ile
            115                  120                  125
Gln Leu Ile Leu Arg Ile Asp Leu Leu Asp Gln Pro Thr Trp Phe Ile
        130                  135                  140
Asn Pro Leu Asn Gly Asp Thr Leu Asn Glu His Thr Leu Asp Val Trp
145                  150                  155                  160
Leu Lys Gly Asn Ile Gly Pro Thr Val Arg Leu Lys Lys Gln Asp Leu
                165                  170                  175
Gln Glu Ala Asp Asn Val Ser Leu Val Arg Lys Ile Thr Asp Thr Ile
            180                  185                  190
Lys Val Ser Leu Met Glu Glu Lys Lys Met Glu Leu Ala Leu Lys Ala
        195                  200                  205
Ser Glu Val Val Leu Thr Phe Asp Pro Asp Asp Pro Tyr Glu Ile Arg
        210                  215                  220
Asp Arg Gly Leu Ile Tyr Ala Gln Leu Asp Cys Asn His Ile Ala Val
225                  230                  235                  240
Ser Asp Leu Ser Tyr Phe Val Glu His Cys Pro Glu Asp Pro Ile Ser
                245                  250                  255
Glu Met Ile Lys Met Gln Ile Asn Thr Ile Glu Gln Arg Leu Ile Val
            260                  265                  270
Leu His
```

<210> 50
<211> 316
<212> PRT
<213> Xenorhabdus bovienii

<400> 50

```
Ser Asp Arg Arg Gln Thr Gly Tyr Ala Tyr Ser Ala Asp His Tyr Arg
1               5                   10              15
Ile Ser Gly Arg Ser Thr Val Cys Thr Val Arg Ala Gly Leu Met Asn
            20              25              30
Tyr Gln Cys Trp Leu Gln His Ala Ala Thr Gln Leu Ser Glu Ser Asp
        35              40              45
Ser Pro Lys Arg Asp Ala Glu Ile Leu Leu Gly Tyr Val Thr Gly Arg
    50              55              60
Ser Arg Thr Tyr Leu Ile Ala Phe Asp Glu Thr Leu Ile Ser Ser Glu
65              70              75              80
Glu Leu His Gln Leu Asp Ser Leu Leu Val Arg Arg Ile Gln Gly Glu
            85              90              95
Pro Val Ala Tyr Ile Ile Gly Glu Arg Glu Phe Trp Ser Leu Pro Phe
            100             105             110
Ala Val Ser Pro Ala Thr Leu Ile Pro Arg Pro Asp Thr Glu Cys Leu
    115             120             125
Val Glu Lys Ala Leu Glu Leu Leu Pro Asp Ser Pro Ala Arg Ile Leu
    130             135             140
Asp Leu Gly Thr Gly Thr Gly Ala Ile Ala Leu Ala Leu Ala Ser Glu
145             150             155             160
Arg Asn Asp Cys Tyr Val Thr Gly Val Asp Ile Asn Ser Asp Ala Val
            165             170             175
Met Leu Ala Gln His Asn Ala Glu Lys Asn Ala Gly Lys Leu Ala Ile
            180             185             190
His Asn Val Asn Phe Leu Gln Ser Glu Trp Phe Ala Ala Val Gly Asn
    195             200             205
Gln Gln Phe Asp Met Ile Val Ser Asn Pro Pro Tyr Ile Asp Glu Arg
    210             215             220
Asp Pro His Leu Gln Glu Gly Asp Ile Arg Phe Glu Pro Ala Thr Ala
225             230             235             240
Leu Ile Ala Ala Gln Asn Gly Met Ala Asp Leu Gln Ala Ile Val Gly
            245             250             255
Gln Ala Arg His Phe Leu Ser Pro Asn Gly Trp Leu Leu Leu Glu His
            260             265             270
Gly Trp Lys Gln Gly Thr Val Val Arg Asn Leu Phe Leu Glu Lys Gly
            275             280             285
Tyr Gln Gln Ile Ala Thr Phe Gln Asp Tyr Gly Gly Asn Glu Arg Ile
    290             295             300
Thr Ile Gly Arg Trp Asn Lys Asn Glu Thr His Ser
305             310             315
```

<210> 51
<211> 289
<212> PRT
<213> Xenorhabdus bovienii

<400> 51
```
Val Glu Met Arg Glu Met Ala Gln Glu Glu Leu Lys Glu Ala Lys Ile
1               5                   10              15
Arg Asn Glu Glu Leu Glu Gln Gln Leu Gln Leu Leu Leu Pro Lys
            20              25              30
Asp Pro Asp Asp Glu Arg Asn Cys Phe Leu Glu Val Arg Ala Gly Thr
        35              40              45
Gly Gly Asp Glu Ala Ala Ile Phe Ala Gly Asp Leu Phe Arg Met Tyr
    50              55              60
Ser Arg Tyr Ala Glu Ala Arg Arg Trp Arg Val Glu Ile Ile Ser Ala
65              70              75              80
```

```
Asn Glu Gly Glu His Gly Gly Tyr Lys Glu Val Ile Ala Lys Val Ser
            85                  90                  95
Gly Asp Gln Val Tyr Gly His Leu Lys Phe Glu Ser Gly Gly His Arg
            100                 105                 110
Val Gln Arg Val Pro Glu Thr Glu Ser Gln Gly Arg Ile His Thr Ser
            115                 120                 125
Ala Cys Thr Val Ala Val Met Pro Glu Ile Pro Glu Ala Glu Leu Pro
    130                 135                 140
Asp Ile Ser Pro Gly Asp Leu Lys Ile Asp Thr Phe Arg Ser Ser Gly
145                 150                 155                 160
Ala Gly Gly Gln His Val Asn Thr Thr Asp Ser Ala Ile Arg Ile Thr
                165                 170                 175
His Leu Pro Thr Gly Ile Val Val Glu Cys Gln Asp Glu Arg Ser Gln
            180                 185                 190
His Lys Asn Lys Ala Lys Ala Met Ser Val Leu Ala Ala Arg Ile Arg
            195                 200                 205
Ala Ala Glu Met Arg Lys Arg Gln Glu Val Glu Ala Ser Glu Arg Arg
    210                 215                 220
Asn Leu Leu Gly Ser Gly Asp Arg Ser Asp Arg Asn Arg Thr Tyr Asn
225                 230                 235                 240
Phe Pro Gln Gly Arg Val Thr Asp His Arg Ile Asn Leu Thr Leu Tyr
                245                 250                 255
Arg Leu Asp Glu Val Ile Glu Gly Lys Leu Asp Met Leu Ile Gln Pro
                260                 265                 270
Ile Ile Ile Glu Tyr Gln Ala Asp Gln Leu Ser Ala Leu Ser Glu Gln
    275                 280                 285
Asp
```

```
<210> 52
<211> 37544
<212> DNA
<213> Xenorhabdus bovienii

<400> 52
ggatcagctg gtttgccacc gggatcccca ccgttgatgc cctgttagcg gaggaattct      60
ggcacggtga caaacaggct ttcccgccct ttacctgccg ttttacgcat tttgaccctg     120
ataaagaaca ggatgttact ctcgttccct cgacggaaga ggcttattgg ctgcaccggg     180
cgttgcaagg ccaaccgtta cacagtgagg tctatggcga cgatggcacc gcgcaggcgg     240
gtatcccta taccgttatg gacagtcggc cccaggttcg gcttctgacg ggtttaccgg     300
gtaactcacc gacagtctgg ccgagtgtga ttgaacagag aacctggcag tacgaacgga     360
ttgccgatga tccgcaatgc catcagcagg tggtgctgaa cagtgaccgc tacggttttc     420
cacgggagac cgtcgacatt gcttatccgc gccgccctaa gcctgcggtg tcaccttacc     480
cggatacgct gccggcgacg ttattcgaca gcagctatga tgagcagcaa cagcaattgc     540
ggcttacccg gcaacggcaa cattaccatc acctgactga cactgaacat caagtgctgg     600
gactgcctga tgtcatgcga agcgatgcct ggggctatcc ggcagcgcgg gtaccccgtg     660
aaggtttcac cctggaggac ttgctggcag agaacagtct gatagccccg ggcacgccat     720
tgacctattt agggcatcaa cgcgtggctt ataccggaac gaccggaacc gaagaaaaac     780
cgacccgaca ggcgctggtg gcttataccg aaaccgcggt ttttgatgaa ttggccttgc     840
aggcctttaa tggcacattg agtcctgaag ccctggaaaa gaaattaatc gagtctggtt     900
atttgtctgt ccacgcccca ttcaataccg gtgcggaatc ggcggtctgg gtcgcccgtc     960
agggatatac cgattacggc gggtctgagg cgttttaccg tccgttggct cagcggacga    1020
cggtgcagat ggcaaaaac accctccatt gggataccca ttactgtgcg gtcgtccgta    1080
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ttcagataac cgatgccaat gacaaccagc aacatatcac actgaccgcg ctggggcagg    1200
tatcatccgg ccggttctgg ggcactgagg aagggactcc gcaggttat accccgcctg    1260
aagaccgccc atttacgcca ccgtcctcag tggcggaagc cctcgacttg aaaccggatc    1320
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```
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atcaggaata tatagccggc tttacgtggc aggcactgct tgacgcgggg gtagtgacgg   1440
aagataagcg ggtttgtgcg ctgggtttcc gtcgctgggt gcaacgtcag ggcattgtgc   1500
tgaatgggca ggcattggcc gattcacggg aacccgtcca tgtcctaacg ctggccactg   1560
accgttatga cacggatccc gatcagcaac tgcgcaagag cgtcacctac agcgacggct   1620
tcgggcgttt attgcaaagt gcagtctacc atgcgccagg agaagcctgg caacgcgcgg   1680
cagatggcag cctgatcacg gacgcgaaag gggcgcccct cgtagcccat acggcaaccc   1740
gctgggcggt ctcaggcagg acagagtatg acggtaaagg gcaacccgtc cgaacctacc   1800
cgccattctt cctgaatgcc tggcagtacc tcagtgatga cagtgcacgg caggatttaa   1860
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cgctctctta attaacacga taacgttaaa taatcacacc ttcctgccag gtacgggga   2040
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caaaaaacgc cggaagtgac ggttctggat aaccggggc tgaccgttcg cgagctccgt   2160
tatcaccgcc acccaaatac ccccaccacc accgatgaac ggatcacccg ccatcggttt   2220
actctctcag gtcagttggc gcacagcatt gacccgcgtc tgtttgactt acagcagacg   2280
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tttgtctggg cagggaacag tcaggcggag aagaacagca acctggccgg acagtgcgtg   2580
cgtcactatg acaccgccgg actgaaccag acggacagta ttgcgcttaa cggcataccg   2640
ctgtccgtca cgcgccagct gctgccggat ggtacggacg cagactggca gggaaacaat   2700
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gacccggtgg ggaacgtggt gaaagtgacg aacgatgcgg aggttacccg cttctggcgc   3120
aaccaaaaag tggtgccgga gaacacctat gtctatgaca gcctgtatca gctggtcagt   3180
gccaccgggc gcgaaatggc caatatcgtt caacaaagca cgctgttacc cactccttcc   3240
ctcattgata gcagtaccta cagcaactat tcccgcacct acaattatga ccgtggggac   3300
aatctgacgc agatacgtca cagtgctccg gccactggta acagttacac cacggacatc   3360
acggtctcag atcacagcaa ccgggcagtg ttggacacgc tgacggatga tccggcaaag   3420
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